MICRO COMPUTER

PRINTOUT

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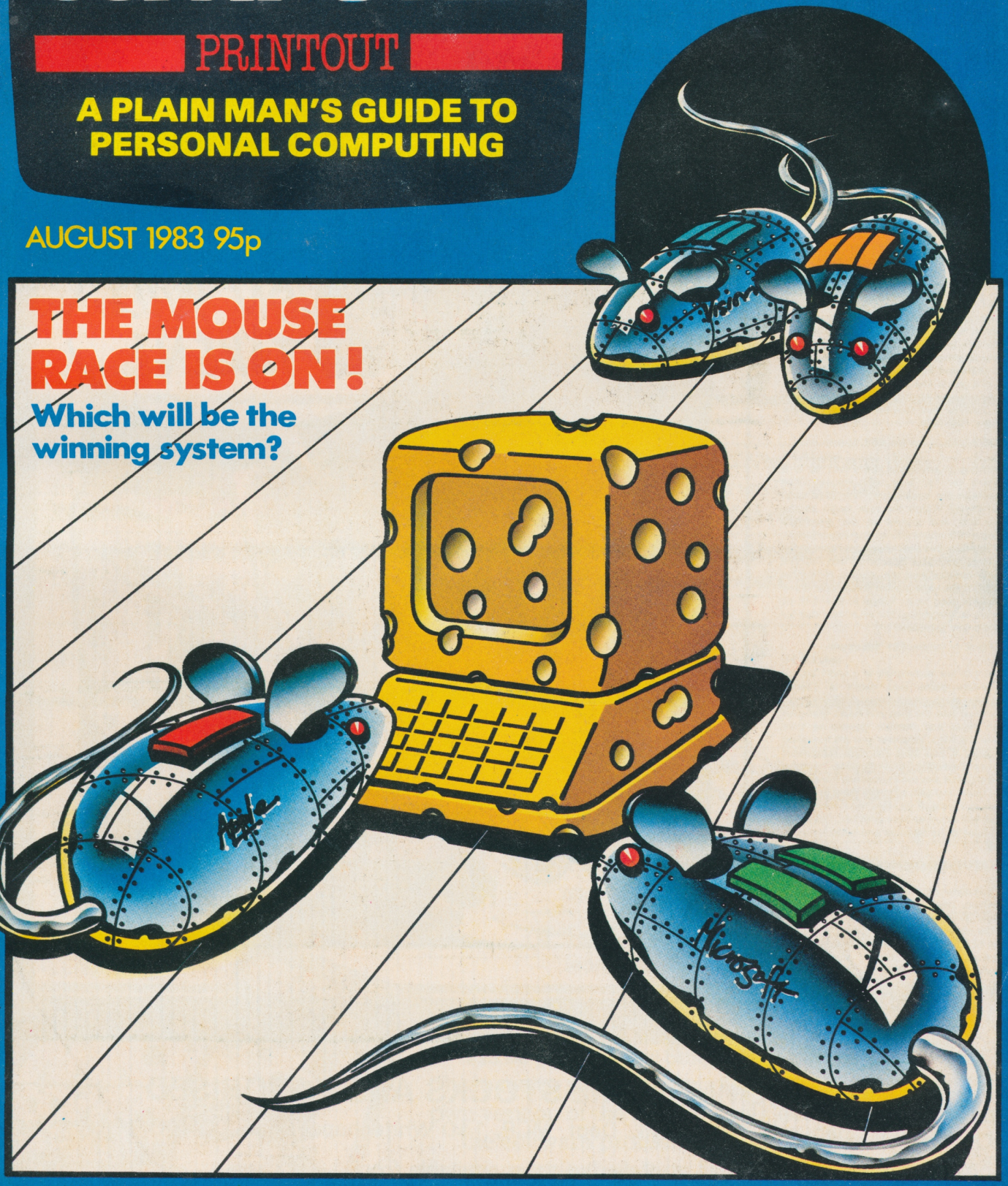
AUGUST 1983 95p



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TEST MATCH — for the 48K Spectrum only £5.95

This is the no. 1 hit of the summer and is a 3D Test Match Cricket simulation. This cassette contains 2 programs — the 1st a full 5-day match and the 2nd a selection of one day tests, full scoreboard and definable teams. The game already contains England & Australian teams and uses the graphics capabilities of the Spectrum to the full.

ALIEN MAZE — for the 48K Spectrum only £5.95

Against the clock you must decode the alien riddle that will defuse the earth shattering bomb in the second 3D Maze. At last there's a programme where the 3 dimensional graphics are not the point of the game. Keeping your heart and remembering the code and where you are is a challenge for the finest mind.

GALACTIC PATROL — Spectrum and 16K ZX81 only £5.95

A fast machine code, arcade style, Star Trek programme with phases, torpedoes, star bases, shields and 4-types of aliens, meteors, damage control and repair and vector flight. Stunning graphics are enabled by superb machine code and there are versions for both machines on tape.

GOLF — for any 48K Spectrum only £5.95

Amazing 3D graphics on a memory mapped course, this programme has over 250 user definable graphics to produce a startingly realistic simulation. You have a selection of 15 clubs and a caddy with a special blow-up of a green. The graphics have to be seen to be believed. You'll wish you had a swing as good as the cartoon golfers. There's even a 19th hole.

DERBY DAY — for the 48K Spectrum only £5.95

Gambling on any horse in the field, up to 5 players can lay bets with Honest Clive Spectrum the bookmaker. Will Clive keep that smile? Watch the race begin as the tape lifts and marvel at the amazingly realistic 3D animation as the riders jockey for position. See the horses and riders in full flight as they pass Spectators and into the home straight past the stands. Hold your breath at the slow motion finish. Sound and colour is used to its fullest in this 44K of superb programming. Not recommended for compulsive gamblers.

RESCUE — for the 48K Spectrum only £5.95

How can we summarise in a short ad, an adventure game that needs a Special Program to detail its Rules! VERY simply, you must find the Map and Radio Men plot your route and monitor patrols as they scour the 40+ locations you are travelling through. If you have the right equipment you can cross into Secret Territory in search of the Castle and the imprisoned Princess. If you find it and gain entrance there are many trails and rests. If you find the Princess you must still return to base with her. Utilises all the Spectrums facilities and takes hours to play.

JACKPOT — for the 48K Spectrum only £4.95

A complete simulation of a popular fruit machine, using definable graphics to the fullest. It contains a complete introduction to the rules of its HOLD, NUDGE, GAMBLE and FEATURE BOX with animated demo. Memory mapped reels, simultaneous revolution, staggered stop, animated bet and payout, payout board and realistic sound effects recreate the original. A must and a wallet saver for any fruit machine buff.

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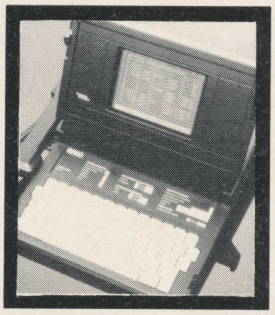

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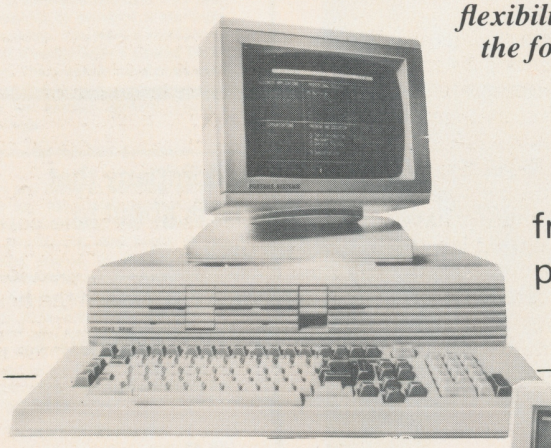

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FRONTLINE

Jeux sans frontières

Maturity is one of those nice, ambiguous words. On the one hand it conveys an image of ripeness and full stature; on the other it suggests the end of a growth period and the precursor to decline.

So when I say that the computer hardware market has now reached maturity, many pundits will disagree on the grounds that the rate of growth is still increasing exponentially; the technology of new machines is changing faster than ever, and this autumn should see an even fiercer battle amongst the high street retailers than last year.

The point is though, that the hardware market is now 'understood'. Micro market observers can model with a substantial degree of accuracy hardware trends of the near future. We certainly know who buys hardware, and why. We can predict the main manufacturers and sales agents, and to a large extent we can foretell the performance of any one product according to a formula involving price, performance, distribution and back-up.

The same *is not* true for software – and more particularly for the video games market. So much has happened recently on this front, with so many disparate announcements, that I can only conclude that this market is still – to continue the analogy – in a pre-adolescent phase. Here is a brief resumé of the events of the last month alone:

One – Atari, following a second disasterous quarter's trading in games hardware, has announced it's intention to produce software for other computers. *Two* – Commodore have made clear their intention of concentrating on the consumer market and software in particular, pricing all ROM cartridges at under £10. *Three* – A growing number of record giants, e.g. EMI, Virgin and K-Tel are moving into the software market. *Four* – Two music records have been released featuring Sinclair programs on the B side. *Five* – Games manufacturers have, perhaps with reason, become paranoid about piracy and, in particular, the issues of software for rental on a 'buy n' try' basis with the option of an 80% refund if it's not all you'd hoped for – or as the software market fears, after it's been copied. *Six* – Some of the hottest selling games are now coming from new and relatively small outfits employing schoolboy programmers for vast sums of money. And *finally* – Some new and sophisticated video games consoles have arrived with a clear upgrade path to a home computer.

No clear pattern emerges from this ragbag of observations. The software market, arguably where the money will be made in the future, is all too clearly in a state of rapid flux, and it will be many months before any principles begin to emerge.

The good news, of course, is that it is the end user, you and I, that is currently benefitting from the turmoil. My only hope is that when the dust begins to settle the market will remain sufficiently competitive to ensure that a better quality of games software emerges.

P.S.

Remember we promised you a major pull-out section aimed at potential business micro users? Well, next month you'll see it – and, believe us, it'll be worth the wait (weight?). We've also got an exclusive interview with someone you listen to on the radio who's planning a micro *tour de force*!

P.P.S.

We pride ourselves on the quality and accuracy of our listings, but last month's was a joke! If you'd like a better copy, send us an s.a.e. The missing line 585 is reproduced below.

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585  GOSUB625:R=W(1):
     IFC$="E"THENSX=1:GOTO390
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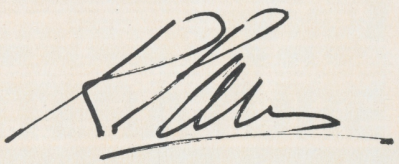
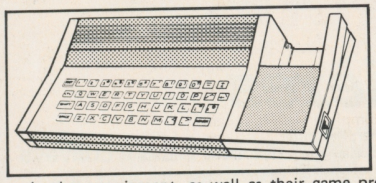
Richard Pawson – Editor



HOME COMPUTERS

AQUARIUS



AQUARIUS: The brand new Aquarius Personal Computer is part of Mattel Electronics latest developments in advanced technology and offers full home computing facilities, as well as extensive game play, using a very wide range of plug in cartridges. Since Aquarius is a Mattel Electronics product, it benefits by the company's wide experience of producing high technology equipment, as well as their game programming expertise which is evident from the advanced games which have been produced for the Intellivision. Aquarius costs £79 and comes with microsoft basic built in. It is so simple to use that you'll be writing your first programs within minutes of taking the machine out of its box. You can even record the programs on your own cassette recorder at home, so you can use them again at a later date. Most available domestic tape recorders are compatible with the Aquarius.

A POWERFUL MACHINE: For all its simplicity, it is also very sophisticated. It has a Z80A processor and 8K of built in ROM as well as 4K of RAM, which is user expandable to 52K. It has a display of 40 x 24 characters, and a graphic resolution of 320 x 192 with a total character set of 256 (including the complete ASCII set with upper and lower case letters, numbers and additional graphic symbols). The keyboard has 49 full stroke moving keys, unlike some of the cheaper machines which have membrane keyboards. The size of the machine (excluding any of the additional peripherals), is 13" x 6" x 2".

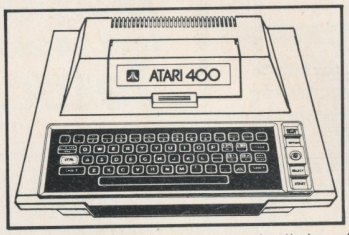
PERIPHERALS: It is very easy to increase the capabilities of your Aquarius as all the peripherals plug straight into one another. You can add a Printer, a Modem, a Data Recorder, Mini Expander and other items. All of the peripherals are very easy to install and what is more, they're easy to use. But the best news of all is, they're easy to afford.

CPM OPERATING CAPABILITY: The Aquarius is capable of being expanded to 52K RAM and later in 1983 a disk drive will be available for it, with the commercial CPM business operating system. This will allow you access to one of the largest software libraries in the world, with literally hundreds of programs available for you to use.

CARTRIDGES: Various sophisticated programs will be launched on plug in cartridges such as a Visicalc type spreadsheet and a word processor. In addition there will be dozens of games and utilities and alternative languages such as Logo, which combined with the built in microsoft basic gives an unbeatable combination of high quality programming ability.

MATTEL AQUARIUS – £68.70 + VAT = £79 **£79**

ATARI 400/800



NEW LOW PRICES

ATARI 400/800: With the Atari Personal Computers, you can play the ultimate in T.V. games, teach yourself new subjects or skills, balance budgets, and even write your own computer programs in Basic.

SPECIFICATIONS: Both the Atari 400 and 800 can display in up to 16 colours, each with 16 intensities. They have four independent sound synthesizers for music tunes/game sounds, giving four octaves with variable volume and tone control on your T.V.'s speaker. The display graphics are of amazing quality, having a detailed resolution of 320 x 192, comprising 24 lines of 40 characters. Atari personal computers have a standard 10K ROM operating system. In addition the standard Atari 400 (£149) comes with 16K of RAM, and the expanded version with 48K (£198). The Atari 800 (£299) comes with 48K as standard. Both the 400 and 800 are now supplied with a FREE £40 Basic Programming Kit, which includes the Basic Programming Cartridge, as well as a 120 page Basic Reference Manual and the 184 page Self Teaching Manual by Bill Carris called 'Inside Atari Basic', so you can begin programming straight away, without buying any 'extras'. Even a mains plug is supplied!

OVER 500 PROGRAMS AVAILABLE: The Atari computers are supported by well over 500 programs available for your use, a larger selection than you will find on any other television game or home computer! The wide selection puts Atari way ahead of the competition. Just fill in the coupon and we will be pleased to send you a full price list which gives details of our range of software available for entertainment, home education, programming and home office use. We think you'll agree when we say it's quite impressive.

100 FREE PROGRAMS FROM SILICA SHOP: If you buy your Atari Home Computer from Silica Shop, you will recieve a FREE presentation pack of 6 cassettes, containing 100 programs including games, utilities and demonstrations. A 16 page booklet giving full details of all of these programs is available on request. If you have already purchased your computer elsewhere you can buy the set of 6 cassettes for £30. What's more, Silica Shop offer a two year guarantee on all computers as well as a FREE joystick. This adds up to a great offer that we believe can't be beaten or matched by any of our competitors.

ATARI 400 16K – £129.57+VAT=£149
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ATARI 800 48K – £260.00+VAT=£299 **£149**

VIDEO GAMES

COLECOVISION

THE SYSTEM: The CBS Colecovision offers new standards in video game play. The excellent graphics are well implemented with arcade titles such as Zaxxon, Lady Bug, Gorf, Wizard of Wor, Carnival, Mouse Trap and the lovable Smurfs. The console comes supplied with a three screen arcade quality version of DONKEY KONG. Parker and other companies have also announced ranges of cartridges for Colecovision, to further enhance the wide range of quality titles available for this new television games machine.

THE CONSOLE: The CBS Colecovision video games system has advanced technology which produces superlative graphics resolution and excellent sound effects. The styling of the console and hand controllers has been carefully researched; the console is designed to complement modern hi-tech equipment, and has clear features for easy operation. The hand controllers allow fingertip control via the 8 direction joystick, and feature 2 independent fire buttons. The push button keyboard is used for game selection and for game control with some cartridges. The hand controllers are detachable and are connected to six feet of telephone coil cable, storing neatly away in the console when not in use.

ATARI EXPANSION MODULE: The Atari converter module allows Atari VCS software cartridges to be played on the Colecovision console, allowing owners the freedom to purchase from the extensive range of Atari compatible cartridges. It also means that existing Atari owners can buy the CBS Colecovision games system without discarding their software library. Silica Shop offer part exchange facilities if you wish to upgrade.

TURBO EXPANSION MODULE: The Turbo Driver Expansion Module allows you to actually drive the vehicle that appears on your T.V. screen. The module consists of a steering wheel, dashboard and accelerator pedal. One hand controller is mounted on the dashboard to provide a gear change unit. The module comes complete with a Turbo Driver cartridge, the first of several cartridges to make use of the module, which provides all the action of sitting in the driving seat. This facility is unique to CBS Colecovision.

HOME COMPUTER EXPANSION MODULE: The Home Computer Module scheduled for late 1983, allows conversion of the games unit into a sophisticated Home Computer. This flexibility of design is an important feature of the CBS Colecovision System.

COLECOVISION - £127.82 + VAT = £147 **£147**

VECTREX

THE SYSTEM: Vectrex is a totally unique Home Arcade System, which has been exclusively designed and engineered to duplicate real arcade game play. Complete with its own monitor display, Vectrex won't cause any arguments over the use of the family's television because it has its own built in screen.

THE SCREEN: Vectrex does not use ordinary display techniques, instead it uses vector scanning to control the images on the screen. With this scanning method, the gun only updates the area of the screen that has changed, whereas a normal T.V. re-transmits the ENTIRE screen 50 times a minute. It is this that gives Vectrex its speed, and means that very little computer power is required for screen control, and the results provide very fast responding and clear images. These 'Vector Graphics' are used in several arcade games such as Asteroids and Battlezone, to give you incredibly high resolution and quality. Vectrex brings all of this from the arcade right into your living room. The Vectrex screen is capable of displaying 80 columns by 40 lines, which is significant to the extensive developments planned for the system.

EXCITING SOUNDS AND ELECTRONICS: Vectrex has an advanced microprocessor with more speed and power and exciting effects than many home video games systems.

REAL ARCADE CONTROLS: Vectrex has a unique control panel, similar to those used in many real arcade games, with 4 concave action buttons and a full 360° self centering joystick. This control panel has a 4 foot detachable cord for maximum player freedom.

REAL ARCADE GRAPHICS: Vectrex has its own 9 inch vertical screen and unlike a conventional T.V. screen, uses advanced display technology to achieve brilliant, high resolution imagery and superb game play never before possible. The Vectrex display provides special effects too, such as 3-D rotation and zooming in and out, which a regular T.V. cannot match. Using a black and white monitor, each Vectrex game comes supplied with its own coloured plastic screen overlay to add to the excitement of game play. The range of Vectrex cartridges (£21.95 each), gives a good selection of arcade games such as Berzerk, Scramble, Rip-Off and Bomber Attack. Vectrex comes complete with a fast paced 'Minestorm' game built into memory.

VECTREX: Vectrex has an advanced state-of-the-art microprocessor with more speed than other T.V. games.

VECTREX – £129.57 + VAT = £149.00 **£149**

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Superman

ATARI

ATARI VCS (2600) — THE NO 1 BRAND LEADER IN THE U.K.

ATARI: The Atari Video Computer System known as the Atari VCS or the 2600 has now become the T.V. game brand leader. In the U.K. there are over 700,000 owners of the VCS with access to a range of over 200 different plug in cartridges, each having a multitude of different variations and difficulty levels. Every system comes complete with the main console, two individual joystick controllers, a pair of paddle controllers, aerial splitter, mains adaptor and a 27 game Combat cartridge. It gives you bright crisp graphics, realistic sound effects and even specially designed circuits for the protection of your Television Set.

SECONDHAND GAMES: We currently have several secondhand Atari VCS units in stock which we are selling for only £49 (inc VAT). This price includes the Console, with Combat Cartridge and all the accessories, as well as a 12 month guarantee. We also have stocks of several secondhand cartridges many at half price (all with 12 months guarantee). We will normally buy back secondhand units and cartridges at one third of our standard price. **£49**

EXTENSIVE CARTRIDGE RANGE: The Atari VCS is so popular that in addition to Atari's own cartridges, there are over 150 compatible cartridges, produced by at least a dozen different third party manufacturers. Silica Shop has one of the largest cartridge selections available in the U.K. Our range of over 200 titles (printed either side of this column), includes items in stock now, as well as many of the new releases for later in 1983.

SILICA ATARI CLUB: Silica Shop has over 20,000 Atari VCS club members registered on our computer. As a specialist company we are able to obtain advance information about new developments and send detailed catalogues to all of our club members, enabling them to evaluate new products before they buy. This is a totally FREE service, to receive your copies complete the coupon below.

SERVICE CENTRE: Atari International (UK) Inc has recently appointed Silica Shop as an authorised Atari Service Centre. This means that we can now service your Atari VCS or 400/800 (under guarantee if applicable), whether or not you purchased it from us.

VCS COMPUTER KEYBOARD: A keyboard will soon be launched to convert the VCS into a fully programmable home computer. For further details, join our club by completing the coupon below. We will then let you know when further information is available.

STARPATH SUPERCHARGER: The supercharger plugs into the cartridge socket of your VCS and expands its RAM almost 50 fold, from 128 to 6,272 bytes. This increased memory adds vivid high resolution graphics capabilities and significantly lengthens the game playing time. Supercharger has a range of multi-load games (at £19.45 each), these offer the facility to play a game in several distinct parts (great for adventures), the next section being loaded when you have completed the previous one, thus enhancing the game play. For further information please complete the coupon below. **£79**

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ACCESSORIES

We stock a wide range of accessories for the Atari VCS and 400/800 personal computers. The same accessories can be used on the Commodore VIC range of computers. The Wico range can also be used with the Texas Instruments computers on purchasing a special adaptor. To give you an idea of the range available, just take a look at the following list:

Trackball by Wico

LE STICK: A mercury filled joystick specially made for one handed operation, with thumb fire button.

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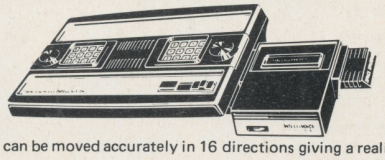
MATTEL INTELLIVISION



MATTEL INTELLIVISION: The Mattel games unit is a most versatile T.V. game which offers 3-D graphics quality for only £98. Each cartridge comes with 2 overlays which fit over the unique hand controller giving easy directions for game play. Using the handset's control disc, objects can be moved accurately in 16 directions giving a realistic simulation of lifelike movement.

VOICE SYNTHESIS: The Intellivoice unit, price £49, is used with special cartridges where high quality synthesised male and female voices feature as part of the game play.

NEW MATTEL CARTRIDGE RELEASES: Why not complete the coupon below and join the Silica Mattel Owners Club and receive our FREE news bulletins and 16 page catalogues detailing new Mattel releases. There will soon be over ninety cartridges available for the Mattel, and a small selection from these is listed below:

MATTEL: Arctic Squares, Burger Time, Buzz Bombers, Chess, Cloudy Mountain, Loco Motion, Mission X, Mystic Castle, Sharp Shot, Solar Sailor, Space Shuttle, Vectron, Winter Olympics. **ACTIVISION:** Happy Trails, Pitfall, Stampede. **C.B.S:** Blue Print, Carnival, Donkey Kong, Gorf, Mousetrap, Smurf, Solar Fox, Turbo, Venture, Wizard of Wor, Zaxxon. **IMAGIC:** Beezer, Dracula, Ice Trek, Nova Blast, Safecracker, Swords & Serpents, Tropical Trouble, White Water. **PARKER:** James Bond 007, Lord of the Rings, Popeye, Q-Bert, Spiderman, Star Wars, Super Cobra, Tutankham.

COMPUTER KEYBOARD: In July/August 1983, Mattel will be launching their new £89, 49-key computer keyboard attachment called 'Lucky' which is fully programmable and has microsoft basic built in. It will transform your Master Component into a home computer. The adaptor also accepts a 6 note polyphonic music synthesiser and full size 49-key piano keyboard that will make learning music as easy as playing games. **£98**

MATTEL CONSOLE £85.22 + VAT = £98.00

VIDEO GAME CLUB

In a fast moving market like video games, it is difficult to keep up to date with all the developments that take place. With new programmes and accessories being introduced at a fast rate by several different manufacturers, it is impossible to get all the information you require from one manufacturer alone. It is for this reason, that we have set up owners clubs for the more popular video games and home computers, to keep you fully up to date with what is going on with your particular machine. As far as we know, Silica Shop are the only company to offer such clubs, but that is not surprising since we are the specialists. We currently have **FREE** clubs for the **Atari VCS, Atari 400/800** home computers, and **Mattel Intellivision.** Soon we will have clubs for **Colecovision, Aquarius** and **Vectrex.** So if you own one of these machines, fill in the coupon opposite, and we will enrol you **FREE OF CHARGE** in the club relevant to your computer or video game.

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READ WRITE

Agree or disagree with something we've written? Why not drop us a line....

NEWTON'S BALLS

I am a first year chemistry student at the University of Bath, the best University in England, if not the Universe (grovel to examiners – creep, creep, etc), and take great exception to John Gowan's comments in the *May 1983* issue of your magazine.

In his article "*Printers: the Silent Revolution*", he called chemistry a mere off-shoot of physics. In my opinion, physics is mere mathematical juggling with figures in order to fiddle the results to match the observed values, whereas chemistry enables one to observe these values in the first place – the whole human body relies on chemical processes to work.

If you look around you in your office now, you see not the products of physics but those of chemistry – plastics, glass, stainless steel, paint, rubber, ink, etc. What does physics give you? A tick-tocking Newton's Cradle and electricity to power your computer, within which silicon chips rely on the chemistry of silicon, germanium and arsenic to work.

I could go on but I think that should be enough to stir up you and your readers.

Keith Hallam
Bath, Avon

P.S. The magazine is great – but I suppose everybody says this to try and get their letter published.

So that's why the human bodies in this office *don't* work.

ATARI AGRO

Having just read the article entitled *'Computer Music DIY'* in the June issue of your esteemed rag, (mag?), I am moved, as a proud Atari owner, to put pen to paper by the feeling that the Atari computers were given something of a raw deal by Miss Coley and Mr Young.

True, sound direct from BASIC is not very inspiring, but at least it might have been pointed out, to the Atari machines' credit, that they are currently the only micros on the market capable of simultaneously generating a melody and 3-part chord harmony (Commodore 64 included!).

However, this is but a minor point compared with glossing over the facilities an Atari computer offers to even the novice machine-code programmer (or anyone prepared to do a bit of POKEing from BASIC even).

Example: Insert high pass filters into certain sound channels. Produce frequencies from 1/8Hz up to 895000 Hz, with a fineness of pitch control similiar to that of the CBM 64 – a range of over 20 octaves, the useful range of which is limited only by the useful range of the human ear (approx. 8 octaves).

For the more advanced M/C programmer it is a matter of a couple of hours with an assembler to produce an ADSR and pitch enveloping system similiar to that of the BBC, which can be used from BASIC without halting processing. However, the feature that really sets the Atari micros apart is the ability to design and play *any* desired waveform, not merely the 3 offered by the Commodore 64. This requires only a 30 byte M/C program and may also be accessed from BASIC without unduly slowing main-line processing. This technique allows very accurate simulation of any musical instrument, even from BASIC.

So don't despair, all you Atarians out there! Your Atari isn't as tone-deaf as perhaps you'd thought!

P. Bates
Stockport, Cheshire

P.S. Congratulations on your June issue and your long-overdue crusade against Olivetti's advertising campaign.

92% PROFIT

I read your May *Frontline* on Wang, with sympathy, but it should be said that such tactics are not unique to Wang.

A short summary of how minicomputers are sold: a stripped version is offered at a price corresponding to the cost of manufacture plus a very modest profit. Ordinarily, this stripped version cannot be used for any practical purpose. Once additional hardware is mounted, the device becomes useful and then even more useful as additional geegaws are bolted on. In the minicomputer business, usefulness equates to capability. What minicomputer manufacturers offer for sale is capability, not hardware. It is perfectly normal for priceing of add-ons to be totally unrelated to their cost of manufacture. The reason Wang wants $1200 to upgrade from 32K user RAM to 64K on their 2200LVP is that the capability of the machine is greatly enhanced by the additional user memory. The fact that this upgrade involves Wang in plugging only $13 worth of 16K dynamic RAMs into a circuit board that's already there is irrelevant.

Hal W. Hardenbergh
President
Digital Acoustics Inc.

P.S. I have just received the latest *MicroComputer Printout* and read Mr Trader's obituary page with interest.

I noticed that Mr Trader did not even warrant enough respect to have the entire page for himself, but that the editor made Mr Trader share space with the advertisers' index.

Re Insider Trader, we felt it wholly appropriate that the curtain should be lowered on his short but full life leaving him staring in the eye, the men that he'd spent his life offending.

Re the question of usefulness v. capability... should the price be tightly related to worth in terms of design-hours and manufacturing costs, or is it legitimate to charge the earth for a gadget which will save you a fortune but which cost little to produce?

An interesting question; we'd like to hear your views and similiar examples.

PULPED PRINTOUT

Having received March, April and May issues of your magazine from a friend who works in a pulping plant, I was delighted with the article *"Making VIC Intelligible"*.

I hope the following observations will be useful to other readers who had the patience to type in these excellent programs.

If the computer is reset using the Run/Stop and Restore keys, the commands on the function keys are inactivated. They can be reactivated by entering any command and pressing RETURN. I find the print command (?) useful for this purpose.

When reprogramming the function keys the computer will accept the abbreviation for the command, i.e, F shift U.

P.S. Just in case pulping plant supplies run out I have now ordered a regular copy from my newsagent.

J.K.Crozier
Dungannon

We take it that this pulping plant is of the type that reads and re-reads our splendid magazine so often every month that it finally falls apart from over-use.

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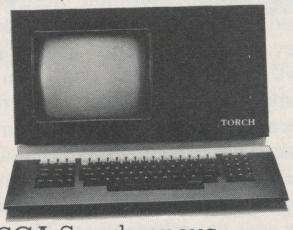

TOSCA Synchronous Communications, and the CH 20Mb hard disc models.

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JULIAN ALLASON'S

NEWSLETTER

A monthly round-up of news, inside stories, investigations and industry gossip, compiled exclusively for *MicroComputer Printout*.

Great Uncle Clive's computer competition

Win a Holiday for two in Silicon valley....

Well, it's that time of the year again. You know, when everyone works themselves up into a frenzy, trying to guess what Uncle Clive's new micro will be like. So let me put my loyal (and long-suffering) readers out of their misery.

The new Sinclair micro is aimed at what Clive is careful to refer to as 'professional' users. Note that he is not describing it as a 'business computer', although it will undoubtedly be put to business use, albeit at the executive end of the spectrum (sorry). Which is to say that you will have no difficulty running spreadsheets, but you might want to think bigger if you are in charge of computerising the ledgers of Inter-Crook Finance Corporation plc.

Contrary to what you have read in other organs, it will not, repeat *not*, incorporate the much ballyhooed Sinclair flat screen television. Naturally this is nothing to do with strikes, sit-ins and other manifestations at Timex's Dundee plant, where production of the wondrous flat screen TV was scheduled. So say the company. But then they would, wouldn't they?

What the new professional computer *does* have is a pair of Uncle Clive's celebrated microdrives, about which you are invited to suspend enthusiasm/disbelief for the time being. For I can now disclose, as Chapman Pincher would say, that the official launch of the long-awaited microdrive is scheduled for early July. Or at least it was at the time of writing.

Do not, however, expect the professional computer to be attached to them at this time. You will have to wait until the turn of the year for that.

Meanwhile, let me tell you that it will have a substantial amount of RAM (my guess is 256K), and an on-board modem for communicating over telephone lines. This is also what we scribes like to call an "educated" guess, although British Telecom have as yet not received any application to connect said modem to their wonderful lines. Naturally, it will also sport a typewriter keyboard.

You will notice that I have not hazarded any guesses about which microprocessor will be used. Rasher colleagues have

speculated on the 16/32-bit Motorola 68000, which would give our friends in Cambridge bags of power to run all sorts of fancy bells and whistles. I am not entirely convinced by this, although it would be out of character for Clive to be overly influenced by the lemming-like rush in favour of the 8086/80186 elder brothers of Intel's now celebrated (thanks to IBM) 8088.

What emerges is that the Sinclair professional computer will probably be supplied with an Osborne-like package of software which, at time of writing, looks like being based on a clever data management package (I am extremely loath to use the word database, which is quite devalued enough without my wading in). It would be fair to expect this to include word processing, spreadsheet forecasting, and diary management software.

I was intrigued to discover that several of my acquaintances in what the *Observer* persists in calling the 'softwear' world have received approaches from Sinclair Research lately. In confidence, of course, but then who keeps a confidence these days?

And now we come to the interesting bit. Price. In accordance with time honoured tradition, *MicroComputer Printout* will be offering a holiday for two in Silicon Valley or tea at the Cafe Lesbos, Cambridge (whichever is the cheaper) to the reader who comes closest to guessing Uncle Clive's eventually striking price for the cheapest "professional" model.

Answers on a postcard any time between now and January to Great Uncle Clive Competition, *MicroComputer Printout*, P.O. Box 2, Goring, Reading RG8 9LN. Please also explain, in no more than 200 words "Why Julian Allason is wonderful". This will be used as a tie-breaker and/or to paper my loo with.

My own entry is £299.95, by the way.

Not a walkover

BASIC has long been synonymous with the name Microsoft. But perhaps not for much longer...

The first computer I ever used ran Microsoft BASIC. And the next. And the one after that. In fact it often seemed as if every darn computer runs Microsoft BASIC (although it isn't strictly true). Why then, one wonders, aren't they all compatible?

And if they aren't compatible, does it really matter if some of the BASICs are written by someone else? It's a fair and apposite question because Microsoft's arch competitors, Digital Research, have produced their own BASIC. Personal BASIC. And very nice it is too, with Sinclair-style error correction, so that if you type in something like PRIMPT A$, which I quite often do, BASIC rejects it immediately, instead of waiting to spring the nasty surprise on you when you actually run the program.

You also get the error messages in plain English instead of *Error #56* or some such gobbledegook. There are several useful *Toolkit* type debugging aids, notably statement number tracing, and breakpoints with single step operation. If you don't understand the importance of those now, you will, Oscar, you will.

But the really interesting news is the bit that Digital Research aren't talking about publicly. And that's the fact that you'll soon see Personal BASIC fitted as standard on some *very* high volume new machines due for delivery towards the end of the year.

JULIAN ALLASON'S

NEWSLETTER

Bodice ripping

"Daphne felt his hot breath on her cheek as he ripped the thin silk from...."

In case you hadn't already sussed, I am writing a novel. A bodice-ripping yarn entitled "Frenchman's Inn". It has all the ingredients you have come to expect: a demure but spunky heroine, Daphne, orphaned into the care of her guardian, the sinister Sinclair Tebbutt and his dog, Oric, whence only the dashing naval hero, Commodore Clive Osborne can set her free.

It is to be an electronic novel, naturally.

Each literary pearl takes shape – like this column – on an ACT Sirius 1 microcomputer running the dumbo-proof *Select* word processor. Thence it is transmitted by telephone line to the Reading node of British Telecom's PSS Packet Switched Service; this shunts the text down very high speed data lines to Telecom Gold's Prime 750 mainframe computer in West London.

There it is posted into the mailbox of my artistic advisor, Dr. Peter Horne, of ACT (Advanced Technology) Ltd. Peter's doctorate is in bit-twiddling and applied chippery, or some such, and his literary tastes begin and end with Westerns. He does, however, know a good novel when he sees one, and often comes back with helpful suggestions about the need for more sex, violence, etc.

Once he has annotated the manuscript, he shoots it back to my wife Jessica's mailbox, so that she can adjudge whether what the dashing Clive Osborne did to the fiendish Tebbutt in chapter nine will appeal to female readers, and do the necessary toning down.

Actually, I'm a bit worried about that. Bodice-ripping novels have always traditionally been bought by the fair sex, who are not, however, noted for their enthusiasm for computers.

My answer to this is that by selling my masterpiece on floppy disk, secretaries will be able to enjoy it whilst appearing to be deeply embroiled in word processing. We might even build in space at the top of each page for some dummy formatting commands at the top in the Working Girl's edition.

Hope for unemployed newsreader

Their services may soon be in demand to provide voices for home computers.

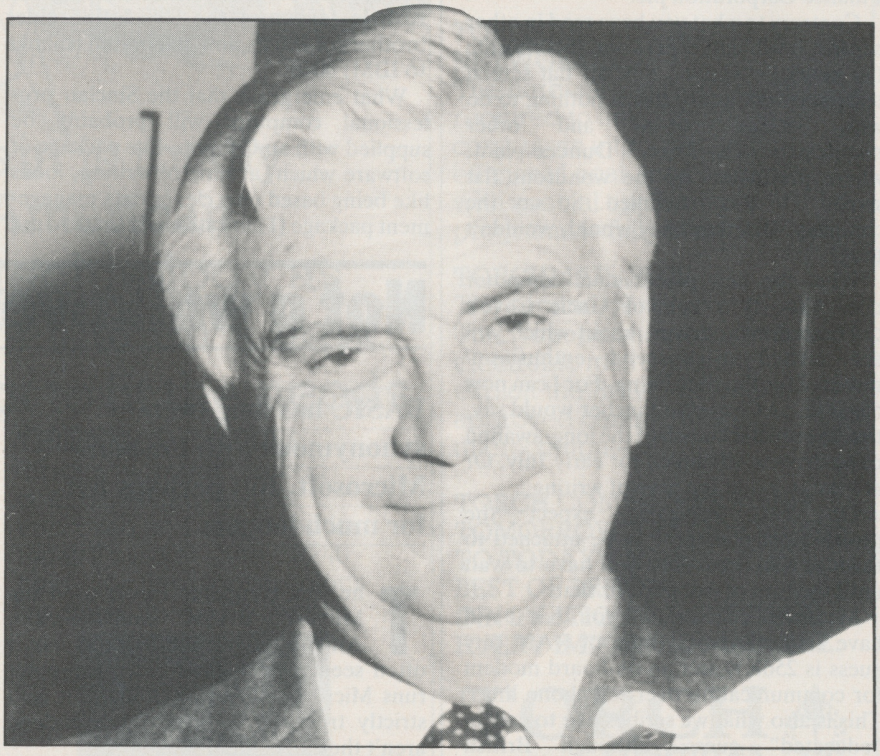
From this month the genteel tones of Mr. Kenneth Kendall, no superannuated announcer he, will be heard enuciating from the interiors of *BBC Microcomputers* throughout the land.

For £55 Beeb owners will be able to have two talkative chips fitted: one a speech synthesiser, the other containing digitised samples of Mr. Kendall's magisterial voice.

Naturally, such a distinguished newscaster would not wish to be heard saying just any old thing. Instead, users will be able to select from a library of standard words he has recorded. From these complete sentences can be assembled and 'spoken' out loud.

Ex-employees of TV AM will doubtless be encouraged to learn that should they invest in Acorn's new talking chip, it will be able to speak on their behalf, saying things like "I...AM...AVAILABLE...FOR...NEW...WORK".

Indeed, there may well be openings for a number of newsreaders, as more and more microcomputer manufacturers and software publishers add speech to their programs. Maidenhead based Kestrel Software are considering using "We fancy Anna the most" grins Managing Director Peter Cox.



Kenneth Kendall: a chip off the old block?

Meanwhile a new £50 system from Adman Electronics of Harrogate enables the VIC-20 to pronounce *anything* provided it is typed in phonetically. "So it would pronounce FORD correctly, but JAY would have to be spelt JAA," explains Managing Director, Keith Hyde helpfully.

And that is the end of the news.

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JULIAN ALLASON'S

NEWSLETTER

Dog to be put down

Will Apple put their III out of its misery before it pines away?

Apple's Edsel they called the *III* when it first appeared in January 1980, but there didn't seem to be much wrong with it when I tried the first production model that month. It didn't actually work; there wasn't any software to speak of; and you probably wouldn't have wanted to write home to your Aunty Mavis about the design either. Apart from that it was fine.

Apple, ever firm believers in their own destiny, plugged on with redesigns, relaunches and promotional expenditure of an order that must have made it a candidate for the most expensive face-saving operation in history.

Yet despite all the faults having been put right, it still didn't sell in more than derisory quantities – at least by Apple standards.

Apple III: knackers in a twist?

Now it seems the company have bitten the bullet and are about to administer the humane killer to an entirely worthy machine that somehow failed to set the world aflame as its illustrious predecessor had. Talking to investors in San Francisco last month, Apple's Vice President for Finance, Joseph Graziano, is reported to have dropped firm hints about its impending demise.

Graziano was, however, quick to reassure the shareholders about profitability. "The shortfall in sales will have no significant effect on the company's results," he promised. Figures leaked to analysts suggest a turnover of $927 million forecast for 1983 against $583 million for the previous calendar year. Pas mal de tout.

With *LISA* generally well received, and *Macintosh* lurking in the wings, now is probably a good moment to adminster the *coup de grace*. The industry will be sorry to lose the favourite butt of its jokes, though.

Vote computer!

This was the first electronic election; but did you notice any difference?

What a fun election that was! And did you see those amazing graphics on T.V? They cost ITN and the Beeb a packet.

And did you also notice how they could have got rather similar effects using a £99 Sinclair *Spectrum*?

And not just the *Spectrum*. A friend of mine cobbled together some pretty impressive psephological graphics on the T1 99/A4. And no doubt the same could be achieved on Atari and the rest.

Mind you, what you really need for this sort of high class horror story is high resolution graphics. My Sirius, for example, can reproduce pictures on screen with definition comparable to *MicroComputer Printout's*. Not that that's saying much.

Meanwhile, in Battersea, South London, my brother, Rupert Allason, was tackling a Labour majority of 7,000 with the assistance of a Clenlo personal computer. Details of party members were stored on floppy disk, enabling the volunteers to be deployed where they were most needed; that at least was the theory. It also handled most of the paperwork quite satisfactorily.

Family snap: sister-in-law Nickie Allason and personal political computer.

By accessing this database, my sister-in-law, the lovely Nickie, could instantly identify a party member with local knowledge of a particular ward to go and canvas there. Access to the system is only obtained by giving the correct personal password. Somewhat optimistically, Rupert's was VICTOR.

The SDP/Liberal Alliance had also plugged itself into high tech with a brand new Prestel system. At 8.15 each morning Alliance hackers were to be seen hammering the text of the daily press release onto a Prestel editing terminal. These words of wisdom were then transmitted to, and stored on, one of British Telecom's central Prestel computers.

Individual candidates and regional party HQ's could then dial up a private Prestel page in sufficient time to offer comment before local evening newspapers went to press.

"We'd have liked to have put the information on a public page where anyone with a Prestel set could have accessed it" remarked Liberal campaign boss, Dick Newby, drily. "But British Telecom got cold feet and said no. It's quite barmy, of course."

The spokesman for Screaming Lord Sutch's Monster Raving Loony Party was still out having his hair done and remained unavailable for comment.

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Forth	-1D-24K-YL29G	£62.95
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Plus over 280 other titles for Atari.

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VIC20

Crush, Crumble & Chomp (+16K)	1C-KK10L	£20.75
Datestones Of Ryn (+16K)	-1C-KK13P	£13.80
Invasion Orion (+16K)	-1C-KK12N	£17.25
Monster Maze	-1E-KK11M	£27.45
Plattermania	-1E-KK14Q	£27.45
Princess & Frog	-1E-KK16S	£29.95
Rescue At Rigel (+16K)	-1C-KK08J	£20.75
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JULIAN ALLASON'S

NEWSLETTER

Which twin is the phoney?

"I am the real *MicroModeller* – buy me."

"No, I am: buy me..."

Personal computer dealers dived for cover last month to avoid being caught in the crossfire of a vicious battle for control of the lucrative market for financial modelling software.

The altercation being conducted between Ashley Ward, boss of market leader Intelligence U.K., and his former sales manager, D avid Low, is considered vitriolic even by computer industry standards. "Frankly, I have never seen so much mud being thrown," said one dealer who pleaded not to be named.

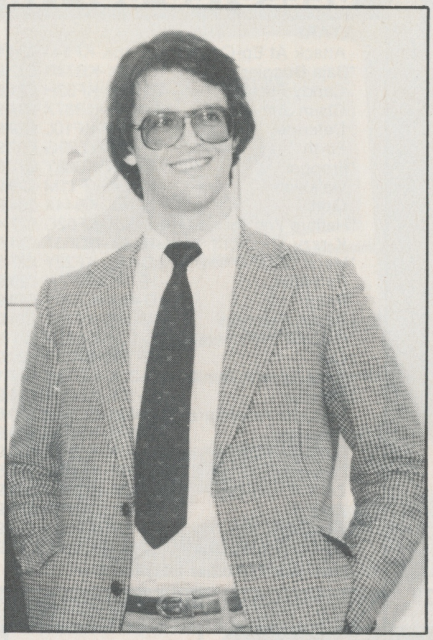
The dispute centres on the ownership and provenence of the best selling *MicroModeller* program. Originally developed by Ferox Corporation in the U.S., British rights were licensed to Intelligence U.K. in 1980. Since then , an estimated four thousand copies have been sold at £550 a time. Last month Ferox announced that it was licensing an improved version of the program to Low and a group of other ex-Intelligence employees, trading as Dataflex Ltd., with immediate effect; they would also terminate Intelligence's contract in December.

Ward, a glamourous figure, known in the industry as the 'Blond Bombshell', promptly retaliated with the announcement of a new and allegedly more powerful version of *MicroModeller* entirely written by Intelligence U.K. "I find it very hard to understand how anyone else could be licensed whilst our contract is still running," he warned. "Furthermore, I am personally upset that people I have done a lot for should be involved in this conspiracy."

Low, one of the industry's more amiable, if hard-nosed operators, who enjoys the nickname of 'Exocet', countered with an invitation to "ask Ward why so many of his employees feel the need to leave?"

Ferox's Vice President Richard Hikes dismissed any threat of legal action. "Ferox has no legal entity in the U.K., so they would have to sue us in the U.S., which would be very expensive. Anyway, we would countersue..."

The question of which is the real *MicroModeller* remains unresolved. "It's very confusing for customers," confesses Anton Redman, financial controller of Smith & Nephew, who is Vice President of the MicroModeller User Group. "If you pressed me, I would have to say that the new Ferox Modeller is worth the extra £150 it costs. But then we haven't seen the latest version of *MicroModeller* that Intelligence U.K. are promising."



David Low – Exocet Blond Bombshell, Ashley Ward

Meanwhile dealers are being put under intense pressure from both companies to take their product. With six hundred of the Times 1000 companies already using *MicroModeller*, it isn't hard to see why.

"The whole thing is just like Dallas," notes Anton Redman ruefully. "Right down to the silver Mercedes in the car park."

'O' Levels

Q.1. 'Microcomputers are now household appliances – demonstrate the truth of this proposition.'

WH Smith's, purveyors of micro mags to the gentry, are open to a network of computer stores. The company, which as you can hardly fail to have noticed, has sold a substantial quantity of low-cost Sinclair home micros, from its ordinary shops. Recently Smiffs showed its competitive teeth by cutting prices ahead of Uncle Clive's official reduction, to the consternation of other high street retailers.

The first computer stores will be 500 square foot shops-within-shops at existing Smiffs branches. Staff are getting three weeks training on a range of machines including the *BBC Micro* and the *Apple IIe*. These new specialist outlets are likely to strengthen Smiffs hold on the software market. Sales are currently put at "a couple of hundred thousand pounds a month" say £2½m a year – nothing to be ashamed about, though it makes you wonder about the megaquid pretentions of certain games software suppliers, something like two thirds of whose sales go to Smiffs, according to the company's John Rowland.

To test the water, three stores are being opened initially – in Croydon, Birmingham and Northampton on the basis that, "if it will work in Northampton, it will work anywhere".

JULIAN ALLASON'S

NEWSLETTER

Down come prices again

Price war – what price war?

Turn to page 42 of the *Los Angeles Times* and you will find a splendid ad for cash and carry microcomputers. The prices usually have a familiar ring to them – except that where you'd expect to pay £129 for a VIC-20, the Californian's have, until recently, been buying them at $129.

Now they are paying even less. In fact VIC prices are heading down towards the $70 level – and fast. It's the same story with Atari, Texas Instruments and several of the other big names in home computing. Indeed, there is a theory that some machines are now being sold for less than cost, the manufacturers hoping to recoup on software sales, on the old Kodak principle.

The question is – will it happen here? I think it has already begun to. Sinclair recently reduced the cost of the 16K *Spectrum* to £99. Atari UK are also offering a 'limited special promotion' for the Atari 400 at £150; Texas are giving TI 99/4A purchasers £50 worth of accessories; and there are reductions in the pipeline from those other manufacturers whose pockets are deep enough to compete.

But make no mistake about it – this is the beginning of a cut-throat battle for market share, which is likely to put particular pressure on smaller British manufacturers like Dragon and Oric.

Such wars are expensive and the resources of even the largest companies are likely to be severely taxed. Even the mighty Warner Communications, them Bros. wot own Atari, reported a loss of nearly $19 million for the first quarter of the year, compared to a profit of almost $78 million for the same time last year. Most of the blame was laid at the door of Atari.

Still, guess who the beneficiaries of all this in fighting will be? US!

Blatant sexism

Stop this disgraceful exploitation of women!

Who do these people Custom Data think they are? Fancy sending us a photograph like this. I suppose they think we would print it just for the sake of getting a bit of extra crumpet in the magazine.

Well, just to teach them a lesson I'm not going to tell you about their *Dietron* program, which they claim to be the world's first computer controlled diet program.

Not that you would be taken in by the claim that this program for the Sinclair *Spectrum* takes care of the real chore in reducing weight – the need to count calories.

In my experience the real chore is stopping eating.

Anyway I advise you not to waste £4.95 at W.H.Smith's. Invest the money in a good supply of Mars bars instead and stop worrying.

Naughty corner

Psst – you lika some feelthy Engleesh software?

You will doubtless be diverted to learn that the top selling program in the UK last month was something called *Penetrator*.

Mercifully, W.H.Smith's, to whom I am indebted for this information, do not describe the program in any detail. "We like to cater for all tastes," said a spokesman.

The truth of this is evident from the rest of the chart, in the number seven position of which is *Blind Alley*, just ahead of *Cruising*.

Any further comment would, you may feel, be superfluous.

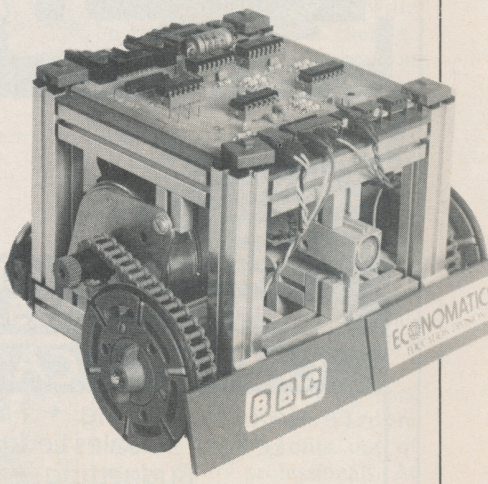
Have sarnies, will travel

At last, the Build-it-yourself personal robot.

No, not the latest Lada. This computerized conveyance will soon be all the rage amongst *BBC Model B* owners desirous of moving their sandwiches from one side of the table to the other.

The *BBC Buggy* is intended to bring computer control technology to the masses. What you get is a Fischertechnik construction kit, set of stepper motors, p.c. boards and cables, all ready to assemble. Oh yes, and the necessary software to make it sing and dance. Well, dance anyway.

If you are interested in getting into the robotics business and have £189 rubbing a hole in your pocket, write to Economatics at 4 Orgreave Crescent, Dore House, Industrial Estate, Handsworth, Sheffield. Tel: 0742-690801



Now if someone will just send the cheese and chutney sarnies in this direction... Left hand down a bit...

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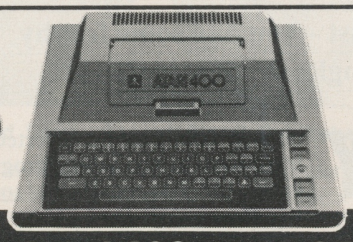
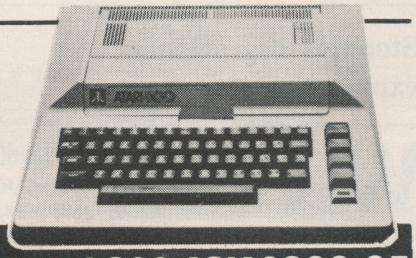
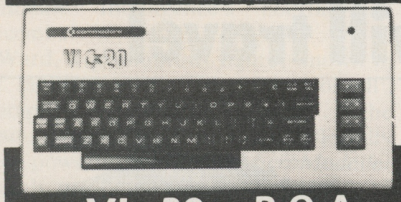


Atari 400 £149.95



Atari 800 48K £299.95

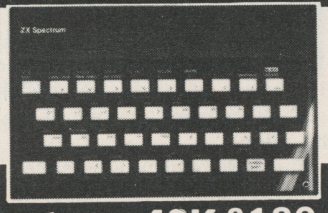


Vic-20 P.O.A

Dragon 32 £169.95

BBC Model B £399.95

Oric-1 £159.95



Spectrum 48K £129.95

Epson HX-20 P.O.A

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EDITED BY GILLIAN ASPERY

& PARAGRAPHS

New applications... New add-ons... New hardware... New software...

Our quick summary of all that's new.

SMART CABLE

An interesting little device found its way over the Atlantic this month; Namely the *SC817 Smart Cable* distributed in the U.K. by KPG-HARDWARE HOUSE at £70 (excl. VAT).

Resembling something that got away from *Return of the Jedi*, it provides a simple method of interfacing most RS232 equipment for the likes of equipment salesmen and engineers. The device senses the RS232 configuration at each end permitting either a male to male or male to female connection.

For further details ring 01 995 3573

MARKET PLACE

Marketplace is the outcome of RESEARCH MACHINES' recognition that their independent product suppliers need nurturing. Hence the birth of their ambiguously named Quality Panel to assess third party software, hardware and publications for the 380Z, LINK 480Z and Network systems, before it is awarded the badge of merit and slotted into this new free catalogue.

For a free copy ring Colin Birmingham, on 0865 249866.

SOFT COLOUR

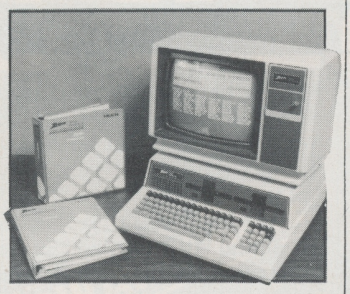
Two interesting snips of news from ZENITH DATA SYSTEMS this month. First, the launch of two Winchester versions of the Z100 series: the *ZW-110-32* their 'ow-profile' micro relying on an external monitor at £3,925 (excl. VAT) and the *ZW-120-32* their 'all-in-one' model with a built in monochrome video display at £3,950 (excl. VAT).

Secondy, the arrival of two new 16-bit colour packages for the Z100 range, namely *Wordstar* and *Supercalc*,

In practice *Supercalc* (£175, excl. VAT), a spreadsheet, shows negative ammounts in red (what else), protected entries in yellow and unprotected in white. The flexible format can cope with up to 63 columns and 254 rows.

Wordstar, (£240, excl. VAT) Zenith's word processing package, allows you to select background and text colours to suit your mood – sadly there's no guarantee that it'll improve your style.

Further details of all four products may be obtained from Geoff Stone on 0452 29451.



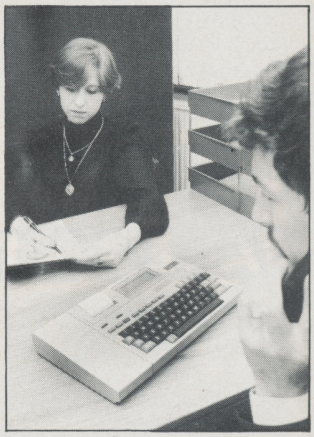
BUNCH OF FIVES

ACT's newly launched office products subsidiary have started life in the obvious place and diversified into printers, five, no less, ranging from a dot matrix at £395 to a daisywheel at £ 1,395. It'll be no surprise either to discover that they're all compatible with the Sirius 1 (and other leading micros brandishing a Centronics parallel interface.)

It is unusual for a company to produce such a broad range, and interesting too to note the emphasis they're placing on service back-up. We understand that forty on station engineers will be there just waiting for you to hit problems; what problems you might well ask?

For further details ring (021) 501 2284

RIP OFF



Solicitors permit yourselves a smile. TECHNOLOGY FOR BUSINESS have masterminded *Timelog* – the ultimate device for squeezing every last penny out of your harassed and bewildered clients.

The system, employing the portable Epson HX-20, is essentially a time-recording database for professionals who charge clients per phone call, letter, sneeze, interview, court appearance (etc).

Imagine the scene. Professional at desk about to write a letter on behalf of client x. Turns to computer, keys in clients name and tells micro that from now until told otherwise he will be drafting a letter. Three months later the case is closed, the professional re-calls x, and demands a printout of total time spent for x costed at varying rates for each different activity. Client is billed, and yet another man curses the day that micros were invented.

As clients, our only consolation is that T for B Ltd are making juicy profits out of these thrifty professionals. At £895 (excl. VAT) the system will have to work well to pay its way.

For further details ring: 01 837 1271.

EDITED BY GILLIAN ASPERY

& PARAGRAPHS

ORIC NEWS

We don't usually have a great deal of news to bring you of the Oric. But now, we're told by the newly software-sensitive company that things are about to change.

ORIC will henceforth be issuing regular lists of software currently available for their micro. Anyone interested, ring Pam Durkie on 01 564 5144.

TAKE AWAY

Those of you, like me, who teeter around the five foot high mark will no doubt be appreciating the current popularity of the word micro.

At last, small really IS beautiful. It is thus a pleasure to report on the arrival of a microcassette data recorder from the towering abode of the ancient Greek gods.

Weighing just 290g. with batteries, and costing £55, incl. VAT, OLYMPUS' *Pearlcorder C100* was designed for use with most portable micros but its two recording speed facility also permits it to double as a standard microcassette recorder.

The Pearlcorder is available from leading stores.

WHAT IF....

For the Thatcherian prodigy, the small businessman, MARKETING MICRO SOFTWARE LTD have a spreadsheet program which may prove of interest.

Entitled *Practicalc* and available for the Commodore 64 and expanded VIC 20 it comes on disk (£29.95) and cassette (£24.95).

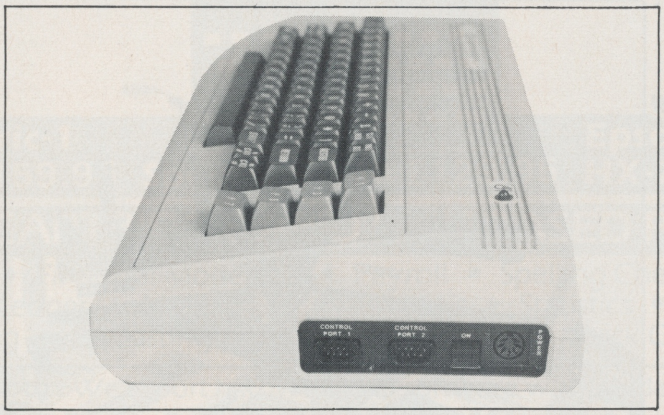
One or two nice features which usually cost a little more include four-colour graphics, and histogram, sort, and search facilities.

Practicalc is available in all leading computer stores but further details may be obtained on 0473 462721.

64 EXCLUSIVE

This month's hottest news is the impending drop in price of the Commodore 64 from August 1st. The amazing new price is £228.49, and with the disk drive also reduced at £224.95, forgive us for forseeing a business system as low as £400 for buyers prepared to shop around.

This is also good news for database manufacturers; com plete with disk drive, the 70K capacity of the bargain priced '64 has the potential to deal with database-type applications.



Talking of which... DIALOG SOFTWARE have a competitively priced and recently enhanced program available on either disk or cassette called *DFM Database* (£24.00 incl. p&p and VAT)

It features up to 15 fields per record; search and sort on any field; select, view, print and calculate facilities; a report generator and is fully user-definable. For further details write to Dialog Software, 19 Short's Gardens, London, WC2H 9AT.

AUDIOGENIC have also just announced *Magpie*. A database at £69.95 designed for ease of use and placing great emphasis on a series of 'pop-up' menus. Available on cartridge it stores data on disk. Contact: Reading 586334.

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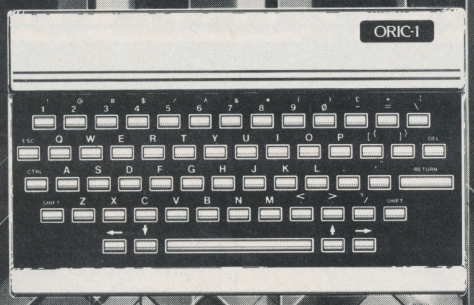

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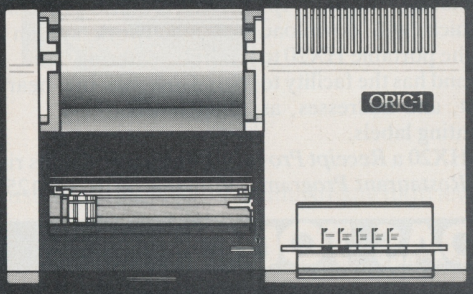

Oric Products are pleased to announce the release of the four-colour printer.
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EDITED BY GILLIAN ASPERY

& PARAGRAPHS

PAWPRINT

Technological development is becoming, at least in part, predictable. Early radios occupied an area of the lounge 3′x4′x1′; today they walk around in top pockets. Fifteen years ago a computer with the capacity of the Commodore 64 occupied an entire room.

The arrival of the microcomputer is a direct result of the miniaturisation of components and in particular memory, but keyboard and screen size have not diminished proportionally; their 'footprint' (the latest addition to micro jargon meaning the area that a piece of equipment occupies on a desk top) remains the same. This is forgiveable in the case of the keyboard where the size is determined by the QWERTY layout (see: *Typing Tutors: a Sexist Approach* for a complete run down of my feelings on QWERTY) but VDU's have fewer excuses.

This month's smug 'I told you so so', therefore goes to NEWBURY DATA and their *Miniature VDU*. Designed with a keypad for use as a terminal on executives's desks, bank counters, post offices and the like, the basic model comprises a 5½″ screen, a 45° x 90° tilt and swivel head and sits on a 7″x10″ base (footprint). It costs around £350 for quantity purchases; characters on screen are sharp and stable but the screen boasts only 12 rows by 40 columns.

For further details contact John Pether on 0784 61500.

A LA CARTE

For the HX20, and the less well-known Epson desk top model the QX10, AP SYSTEMS have just launched a new range of software.

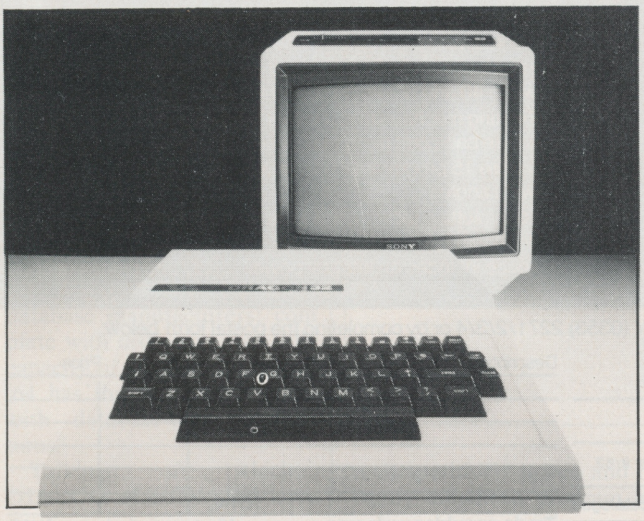
Predictably it includes a word processing package with the stimulating name *Apwriter*, which will download text from the portable HX20 to the QX10 and has the facility to merge text, and addresses, as well as printing labels.

For the HX20 a *Receipt Program* and *Restaurant Program* incorporating accounting facilities have also just emerged. The former enables the HX20 to issue invoices, and combined with the latter it will itemise receipts at the point of sale.

AP are also promising news of a network system for the hotel, catering and grocery industries in the near future. Stay tuned.

For further details ring Tony Williams on 01 399 1257.

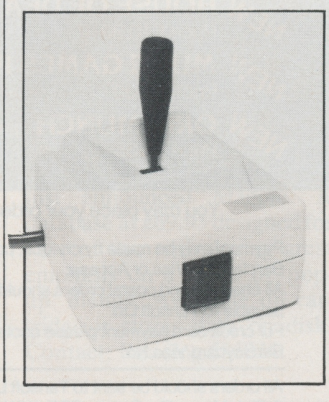
MIDAS TOUCH



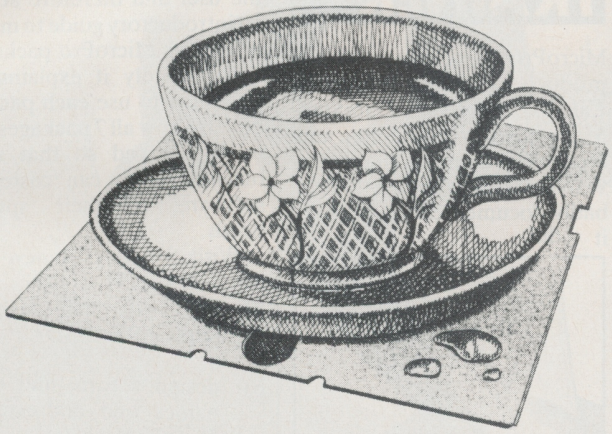
Atari and VIC users have been deluged with joysticks of late as an ever-increasing number of manufacturers have thrown themselves onto the micro merry-go-round. Dragon and the BBC micros, a few furlongs behind in the micro sales race, have however been left a little short on peripherals.

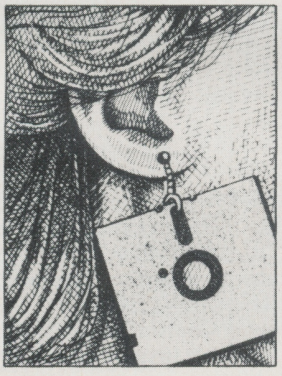
Not so any longer ... MIDASONIC of Yateley, (centre of the Universe) have entered the fray. At £17.50 per pair inclusive they are offering *joysticks* for the Dragon and BBC, and have promised good news for Spectrum owners soon.

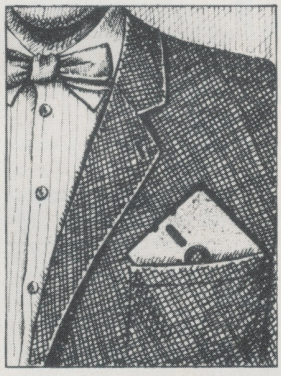
For further details contact Midasonic, 9 Firglen Drive, Yateley, Camberley, Surrey GU17 7RT

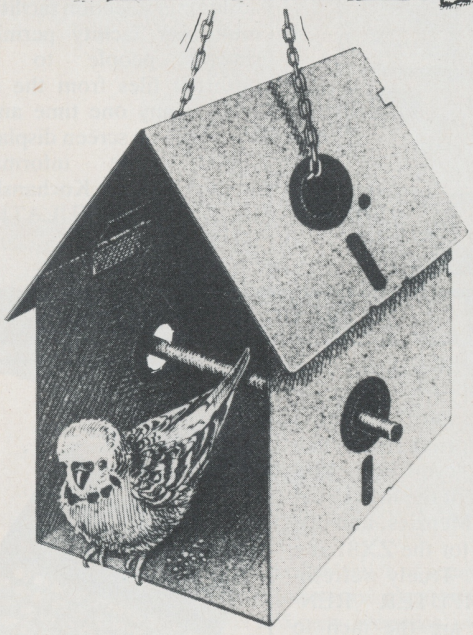


Now that Superfile is here: some good things to do with yesterday's databases.









Don't throw those old disks away! An obsolete database could make some budgie very happy. Superfile, the advanced new British database manager, could make you even happier. Just look at the advantages:

☐ Variable length items – store the data you type in without padding – double your disk capacity.

☐ Search on all items in the database.

☐ Flexible records – add new Fields at any time.

☐ Superfile tacks itself onto CP/M and makes the database accessible to programs in any high level language.

☐ Logically a multi-file database: relational searches easily done via high level language.

☐ Simple-to-use Screen Forms and Report generator packages.

☐ Multi-user – on MP/M, CP/Net, Turbodos Shelton SIG-NET.

☐ Made in England and widely used by the Government, Hospitals, schools and Universities.

☐ Prices: single user £485, multi user £710.

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& PARAGRAPHS

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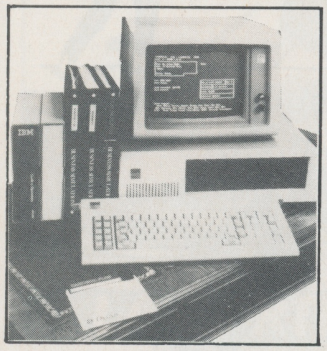
BLUE FILE

When told that such n' such is "used by several government departments" I'm never quite sure whether to regard it with admiration or scepticism.

Either way we were interested to hear of the arrival of *Cardbox – Plus* at £300, excl. VAT, the up market and up priced version of *Cardbox* the database distributed by Caxton.



The new program inevitably has a number of additional features notably that its indexing and searching extends to numbers and dates, an advantage for the salesman wanting a reminder of who to call when.

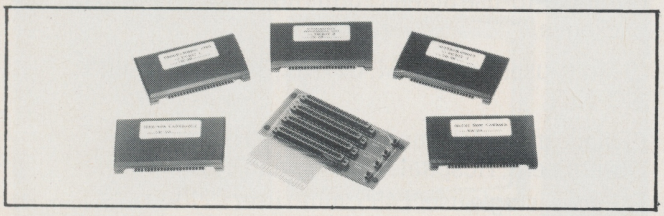
Other improvements include additional selection facilities, a multi-user facility permitting several people to draw different files from the same base at any one time and an improved on screen display.

For more information contact Martin Kochanski of BUSINESS SIMULATIONS LTD on: (0892 86) 3105.

BARRIER BROKEN

An increasing awareness of the importance of software has recently seen hardware prices fall and software prices rise. When this starts to get you down stroll into a branch of the high street giants, John Menzies, and discover games for the ZX81 at a mere £3.50. Truely refreshing... COMPUTER RENTALS LTD are the men to thank, *Escape from Manhattan*, *J. D. Arcades*, *Alien Rain* and *Outrider* are the names to look for.

WEAR AND TEAR

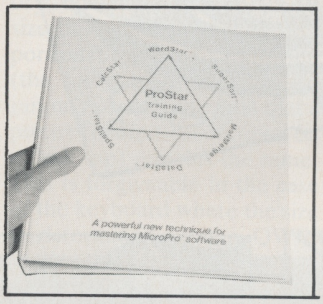


An interesting idea that emerged recently from a browse through STACK's catalogue is a *4-slot Motherboard* for the VIC 20 at £33.35 (incl. VAT). Wear and tear on the VIC cartridge port and for that matter on popular and valuable cartridges is a costly worry if you're constantly inserting and removing the same old favourite few. Stack's idea circumvents this problem. Up to four cartridges may be left in place and the required program selected with a switch.

For more information, or a catalogue ring their sales department on 051 933 5511.

MICROPRO TRAINER

MicroPro software, whose products include *Wordstar*, *CalcStar*, *SpellStar*, *DataStar*, *Mailmerge*, *ReportStar* and *SuperSort*, numbers among the vast array of software that is badly documented – or rather, it did.



Recently, after two years experience of installation support and training for MicroPro users, Jane Davis recognising the need for a well written guide to MicroPro products for beginners to microcomputing, has established JANE DAVIS PUBLICATIONS and brought out a *ProStar Training Guide*.

It is well planned and well written, and novel in two respects: it assumes nothing of the user and therefore acts as an introductory guide to micros as well as MicroPro packages, and secondly it explains not only how to use each package but also how all 7 packages may be interlinked so that small business users can customise software to their specific needs.

With two days a new user can:

a) learn to type a simple letter in *WordStar*,

b) design a form and enter names and addresses in *DataStar*,

c) sort these into alphabetical order using *SuperSort*, and

d) merge the letter and data file to produce letters and envelopes using *MailMerge*.

Not bad eh? Certainly cheaper than a training course for each new employee.

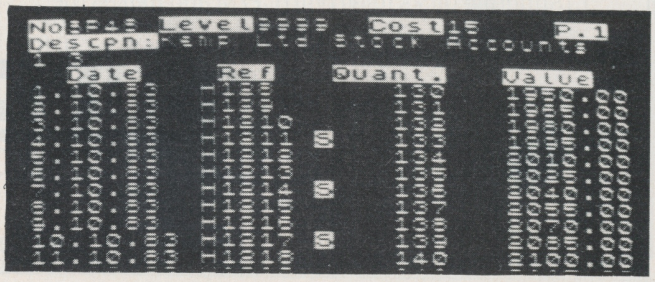
ProStar Training Guide costs £29(incl VAT and p&p). Contact Jane Davis on 0386 841181.

SPECTRUM £'s & p's

The recently reduced Spectrum, from the newly knighted Sir Clive, continues to hold its own in areas other than its chief conquest games software.

KEMP LTD have this month launched three packages: *Sales Ledger*, *Purchase Ledger* and *Stock Accounting and Control*, each on cassette and priced at £14.95 (incl. VAT and p&p). The latter will provide a monthly ledger account printout, all three have data validation routines for safety and feature a full audit trail whereby every entry, deletion, alteration (etc) is recorded in the monthly printout.

One cautionary note, however, we have not evaluated this package, and if it needs to be said you can't expect the same features in a £14.95 package that you might when paying £200. Ring Kemp on 01-444 8499



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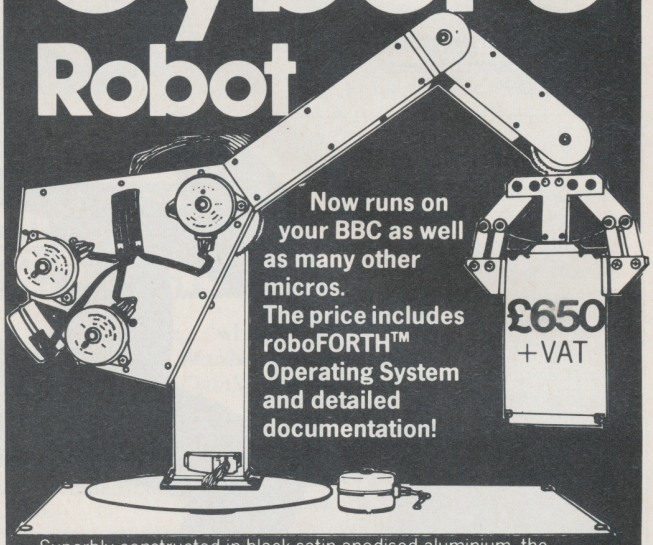

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MICROS FOR GAMES

WHICH IS BEST?

A lot of rubbish is talked about home computers; especially, as now, in times of fierce price-cutting competition. But after all has been said and done, there are facts which it is hard to ignore. *David Kelly* examines home computer history and offers a few buying tips.

Video games have been hard to ignore. Who has not heard of *Space Invaders* machines or of the generation of kids rendered 'super-reactive' through playing them?

They began in the arcades and spread to domestic video games players, and home computers. The only limiting factor in each case has been the capabilities of the machines involved – which have been developing at a fantastic pace.

But there are now fundamental changes taking place. In the past the emphasis has been on increasing the sophistication of the hardware. That time has passed and it is now the *software* that is important. The reason is obvious: those who play video games want to play the best and it is what is on the screen that is important, not how it gets there.

This was first felt in the arcades where the hardware now follows naturally as the *means* to realise a new games idea. Three-dimensionality is the current rage – that and an obsession with achieving real-time animated graphics. Atari's coin-op game *Pole Position,* for example, is a very impressive Grand Prix race simulation incorporating all sorts of perspective effects – as you drive into the screen gantries pass overhead, advertisement hoardings appear, grow larger and pass by, the landscape changes ahead as the track bends. The effects are so dynamic, that when Atari software expert Anthony Jones first tried it out, he fell out of the console going round a corner! The game came first, and then the hardware was built to create it – very sophisticated it is too.

Some of the very latest arcade machines now incorporate video disk players to mix live action and computer graphics on the same screen. All this is a long way from the very first efforts, less than ten years ago. Remember the *Pong* tennis game?

Coin-op arcade machines start out with an advantage over home computers

and video games players. The machine can be individually tailored to the requirements of a particular game. This is fine because when you are bored with one machine you can move on to the next. Or the arcade will have it trundled away and replaced with something more popular.

With home computers and video games players things are different. Since the consumer changes hardware only occasionally it must be versatile enough to play a variety of games.

In 1977 Atari brought out its VCS games player. A console capable of accepting a range of plug-in games cartridges playing, to begin with, adaptations of Atari's successful arcade games. Even though it is now looking a little long in the tooth it has sold well, particularly in the US where it is the leader in a market in which around 17 million units have been sold. The thinking behind it still holds good: play the game in the arcades and then get the home VCS version. This tactic has proved to be successful with titles like *Galaxians, Phoenix* and *Centipede*. Or the very fine *Pac-Man* and his pal, *Ms Pac-Man*.

Largely because of its success in the US – it has not done as well in Britain as Atari had hoped – other companies soon launched similar products. Mattel, stepping into what was new territory for them, put out the Intellivision system, and Philips developed the G7000 machine.

The Intellivision from Mattel has, together with the VCS, dominated the games console scene until recently.

With *Missile Command* on-screen, the Atari VCS.

ET disappointment

Since 1978, when the Intellivision came out, surprisingly little has happened on the games console front. Prices have dropped. Mistakes have been made – Atari's recent *ET* game was a disappointment and manufacturers have found it difficult to break out of the mould they have created for themselves – that of simply recreating the popular arcade titles in the home.

However, video games players now face an even bigger problem. Home computers. In the five years that the VCS and Intellivision have been on the market the development of low-cost home computers has leapt forward to such an extent that some of the games software now being produced for microcomputers is of a higher standard than the video games titles. And now, not only do the computers cost the same, but they are more versatile. In the US the 'population' of games consoles and computers is about the same. In the UK computers dominate. More important, micros are now selling at a much faster *rate* than video games systems.

This has left the VCSs and Intellivisions stranded. Their response has been to produce computer keyboard add-ons – which misses the point. It is not that the games consoles don't compute – it is more that there is now actually a greater wealth of games software available for some of the home computer brands.

When the VCS system was launched in 1977 the low-cost home computer seemed a long way off. Commodore PETs and Apples didn't look like competiton. In the US these machines presented more of a threat than here – simply because a greater number found their way into homes. The British micro scene, however, developed differently.

There is only one reason for buying a particular machine – software.

The launch of the Texas Instruments 99/4A colour computer in 1979 was marred by an initial attempt to sell an NTSC (American colour TV standard) version which had to be used in conjuction with a special TV – together, the cost was over £1,000. The only other contenders were the Atari 400 and 800 computers which remained over-priced until very recently. This may have been an attempt by Atari to protect the market for its VCS but, for whatever reasons, the opportunity was there for someone to step in and produce a low-cost micro.

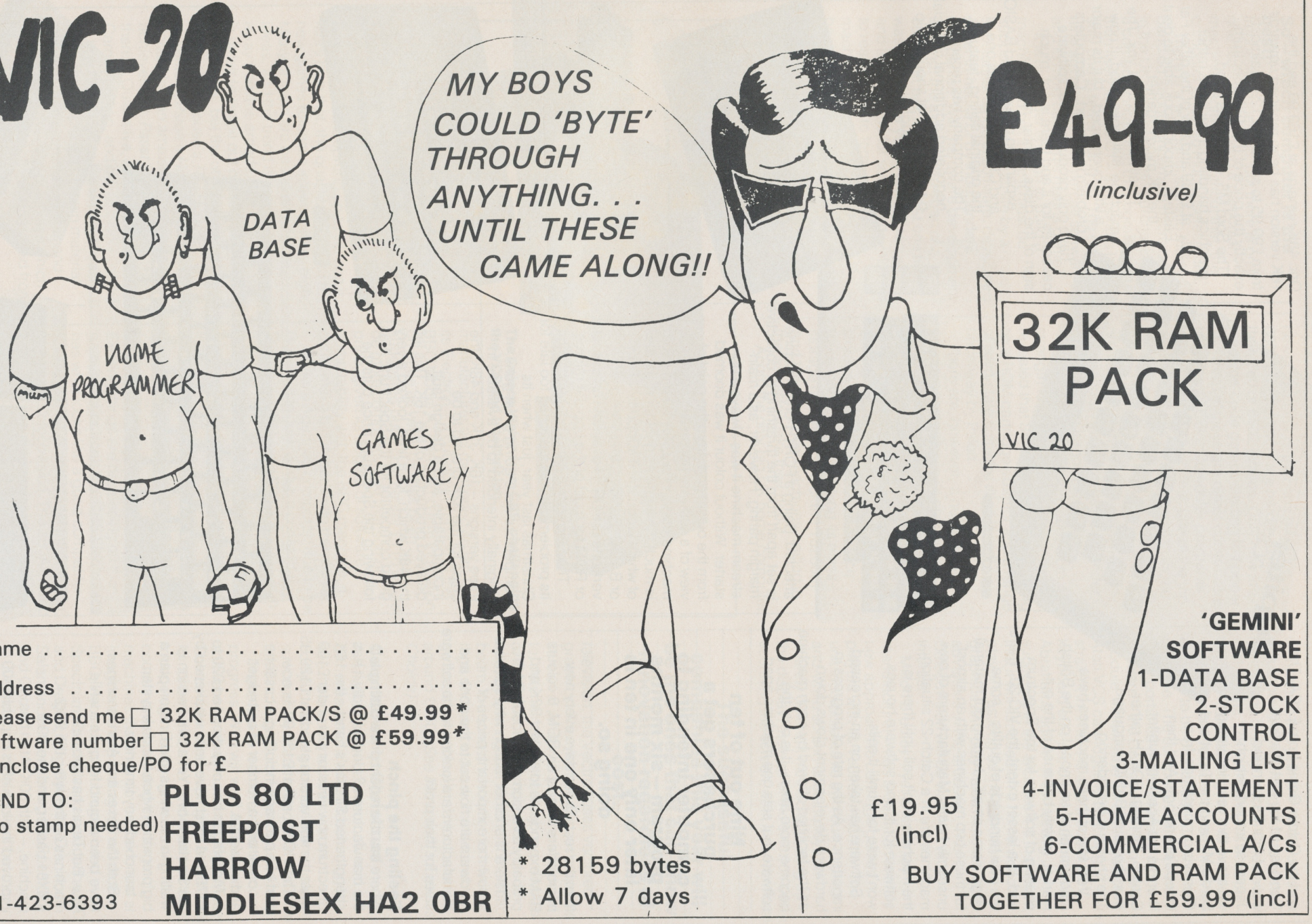
Hot competition

And sure enough it happened. Sinclair put out first the ZX80, followed by ZX81. And around Christmas 1981 Commodore came through with its VIC 20 colour machine at £199.

Sinclair responded with the Spectrum – a machine which took many in the industry by surprise. The Spectrum dramatically reduced the price expectation of the consumer. Texas dropped the 99/4A price to £199 and Commodore brought the VIC 20 down to £175, all to no avail. Despite its initial teething troubles the Spectrum sold very well. After dropping the VIC to £139 that machine has also been successful and the Commodore 64, launched last Christmas, looks good.

Sinclair and Commodore have not been the only manufacturers to see the low-end home computer as a worthwhile venture. In August last year the Welsh toy company, Mettoy, launched the Dragon 32 and this was followed at the end of the year by the Oric 1, the Lynx

VIC-20



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and the Colour Genie from EACA. The Genie is just the first of a tidal wave of Far Eastern and Japanese imports which will arrive this year, including Sord's M5 and the Texet and Creativision machines from Video Technology. And then there is the Ace from Jupiter Cantab, running FORTH rather than the usual BASIC language. The choice is bewildering.

Very few of these machines have made much of an impact on the British market, mainly because of the out-pouring of software for the Spectrum and, to a lesser extent, the VIC 20. There are now hundreds of outfits – some large, some small – turning out material for these two machines with an almost unseemly haste. Manufacturers of new machines are in a Catch-22 situation: the machine won't sell until there is software for it, and software houses won't write for it until it sells.

Software has taken on an increased importance. As the rate of progress in hardware development slows down – as the facilities offered by each machine become more alike – it is only the software that sets one machine apart from the rest. These days every new micro offers at least 8K ROM, 8 colours, RAM expandable to at least 32K and probably a version of Microsoft BASIC.

Nine out of ten purchasers get a computer intending to program – six months later only one in ten is doing so.

There is another reason why software is now more important: prices of hardware are now cut to the bone and manufacturers are looking to the software sales for their profit.

Feeling the pinch

Where has the recent price cutting left the manufacturers? Undoubtedly it has strengthened Sinclair's hand – the 16K Spectrum now sells for just under £100 while the 48K version stands at £129.95.

The VIC 20, still at £139.99, is now part of a package including a cassette recorder and a number of cartridges and cassettes.

The Dragon has only dropped £20 to £175 and must have been weakened by the Sinclair move. Yet a 64K version is waiting in the wings and Dragon plan a big promotion when the disk system is launched, any time now.

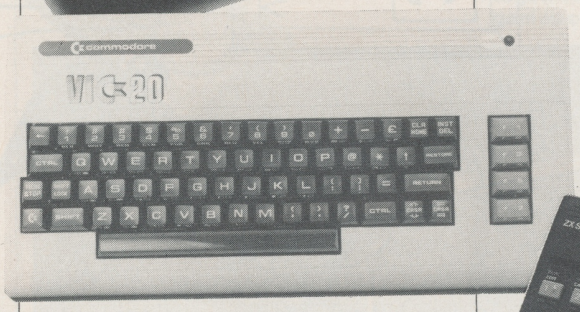
Both the Texas and Atari machines have been around for quite a while now. But Texas has two new machines on the way: the 99/2 – a ZX81 basher, and the 99/8 machine, – with 80K. Atari has improved the look of its capable 800 machine with a price drop to £299.

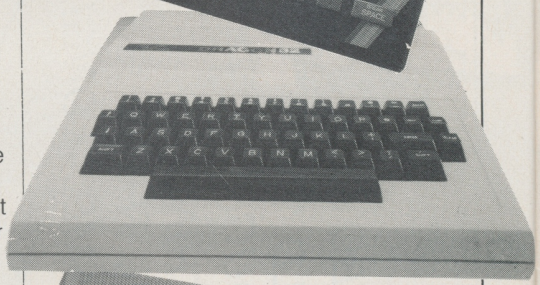
The Ace will probably be little affected. Being a FORTH-only machine it is set apart from the thrashing of collective margin paring. However, as a main-stream machine it was always a non-starter. Without colour it was doomed from the outset and, from the point of view of a software house writing in machine-code, one Z80A-based micro is much the same as another regardless of which language it supports – FORTH or BASIC. Besides, there are now versions of FORTH available on cassette or ROM for most of the popular micros.

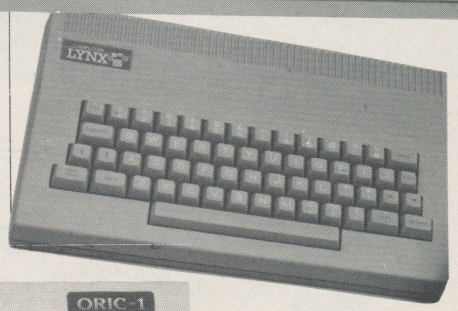
The Oric – well! It has not been without its problems. It was launched too late for Christmas last year, just when its competitors were going great guns. Originally intended to be available in three versions – 16K, 32K and 48K, the chips for the 32K proved to be incompatable, and a design fault delayed production of the 16K. This left the 48K which, for a time, looked a very good competitor for the Spectrum. Alas, following the Spectrum price cuts the Oric 48K remains at £169.99 and the 16K version has been repriced *upwards* from £99.95 to stand at £129, – almost exactly the price of the 48K Spectrum.

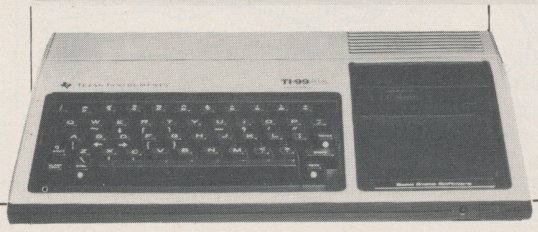
The Sord M5, despite its good graphics handling, now looks rather silly at £189 and few of the other Far Eastern imports look able to dent the UK micro market.

Finally there is the Lynx. The machine still looks good, if now a little overpriced, but its major problem is support. Camputers have only produced two software cassettes for it and there is not much sign of the disks, printer, memory expansion or extended BASIC and CP/M which was one of the original selling features. The company has recently negotiated additional financial backing so that should help it carry through.









So – which computer is the best!

Impossible question, but there is only one reason for buying a particular machine – software. Without that, the computer is just so much useless junk.

There is a wonderful statistic much bandied about concerning micro buyers in the UK: nine out of ten purchasers get a computer intending to program (more than likely in BASIC) – six months later only one in ten is doing so. The other nine are running commercial software and in most cases this means games.

It is no longer enough to build a machine and put it out. It must be supported throughout its life by a substantial range of software, developed either in-house or by independent companies. With hardware development slowing, the average life-span of a computer has lengthened. At one time it was less than a year. Now it is longer and there is time for software developers to really come to terms with each machine. Computer games are beginning to stretch the hardware and develop types of games other than arcade-game remakes: adventure games, board-type games and simulations.

The Coleco Vision from CBS, challenging the VCS and Intellivision.

Clear Winner

In games software there is a clear winner – for the moment at least – the Spectrum. It is over a year since the machine was launched and a great number of companies have sprung up to service it. More than that, the quality of some of the new games releases is awesomely high. Many of them are based on original ideas, and the trend is now definitely away from the arcade rip-off. Perhaps it is unfair to single out particular companies, but the obvious ones are Melbourne House's *The Hobbit* adventure, Psion's *Flight Simulation* and *Scrabble* – an amazing programming achievement. *Pssst* from Ultimate. Then there is Quicksilva, Artic, DK 'Tronics, Carnel, and on, and on.

In software terms the nearest rivals are Commodore with its own material and that from Llamasoft, Romik and Rabbit. And the Atari machines which have a wealth of software imported from the US.

The Dragon is not yet as strong on software, – perhaps because it is a newer machine or perhaps because 6809 programmers are harder to find than Z80 or 6502 junkies. Only now are machine-code games starting to appear and most of these are direct conversions from Tandy Color Computer programs sold in the US. Microdeal, one of the top houses, imports all its material from the likes of Tom Mix – and the standard falls short of the best on the Spectrum. There are very few British houses writing for the Dragon – they include Salamander, Peaksoft and Dragon themselves.

In the UK the Spectrum goes from strength to strength. It was recently revealed that Sinclair have been working on a ROM cartridge adaptor and a range of solid-state software titles is well underway by Psion.

There are, however, a number of possible obstacles to its continued domination.

Commodore will reduce the cost of its '64 machine substantially in July. Sinclair's ever-so-exclusive Microdrive storage system could fall on its face (certainly, Timex is keeping its mass-storage options open for the TS2000). And there are new machines waiting in the wings to make their debut.

Acorn the only big UK home computer manufacturer not mentioned so far, has its Electron – a cut-down version of the BBC Model A. There is no firm indication on price as yet, £150 has been suggested but a cost nearer £110 would be more competitive. At that sort of price, given its degree of software compitability with the BBC machine, it could make big inroads into the market.

Mattel's Aquarius computer, due to be launched in July, is also a contender. The price – between £80 and £90 – is in the right area and the company is strong on software. It is expandable up to 52K, it has a ROM cartridge slot and it will support CP/M.

The new MC10 from Tandy and Texas' new machines will also be interesting.

Arcade quality TV games

Exciting things are happening on the games player front, too. CBS Electronics has what looks like a good competitor for the Atari VCS and Mattel Intellevision, called the Colecovision. The Z80A-based TV games system is to be launched in June at £149.95; its graphics handling is impressive. CBS's marketing man Alan Abrahams says: "The successful companies this year will be the ones that can show innovation regardless of cost". He is being hopeful, but the Colecovision system has 17K RAM and will accept big 32K ROM cartridges. This enables very passable versions of titles from the arcades to be produced – *Zaxxon*, for example. The company is also aware of the importance of an extensive range of software – the Colecovision Expansion Module 1 allows the full catalogue of Atari VCS cartridges to be plugged straight in. There is also a computer keyboard add-on, due in Summer. Alan Abrahams again: "If something succeeds in the arcades it is inevitable that it will succeed on a home video player – as long as the transition in graphics and play value matches up to advances in the arcades". The Colecovision will be watched with interest.

Milton Bradley – yet another toy manufacturer – has brought an entirely new approach to cartridge games players with its Vectrex machine. The unit incorporates its own built-in black-and-white screen and employs an entirely different method of putting up the display. Instead of the electron beam scanning the screen, as in a conventional television, the Vectrex uses vectored graphics. The electron gun just zaps the screen at whatever point it is instructed to, determined by the $x - y$ co-ordinates of the location. The machine is quick and, by altering the 'focus' of the electron beam, the screen resolution is infinitely high. Different indeed. The Vectrex will go on sale in a couple of months at around £150. *(See this month's Expert's Choice)*

The successful companies this year will be the ones that can show innovation regardless of cost.

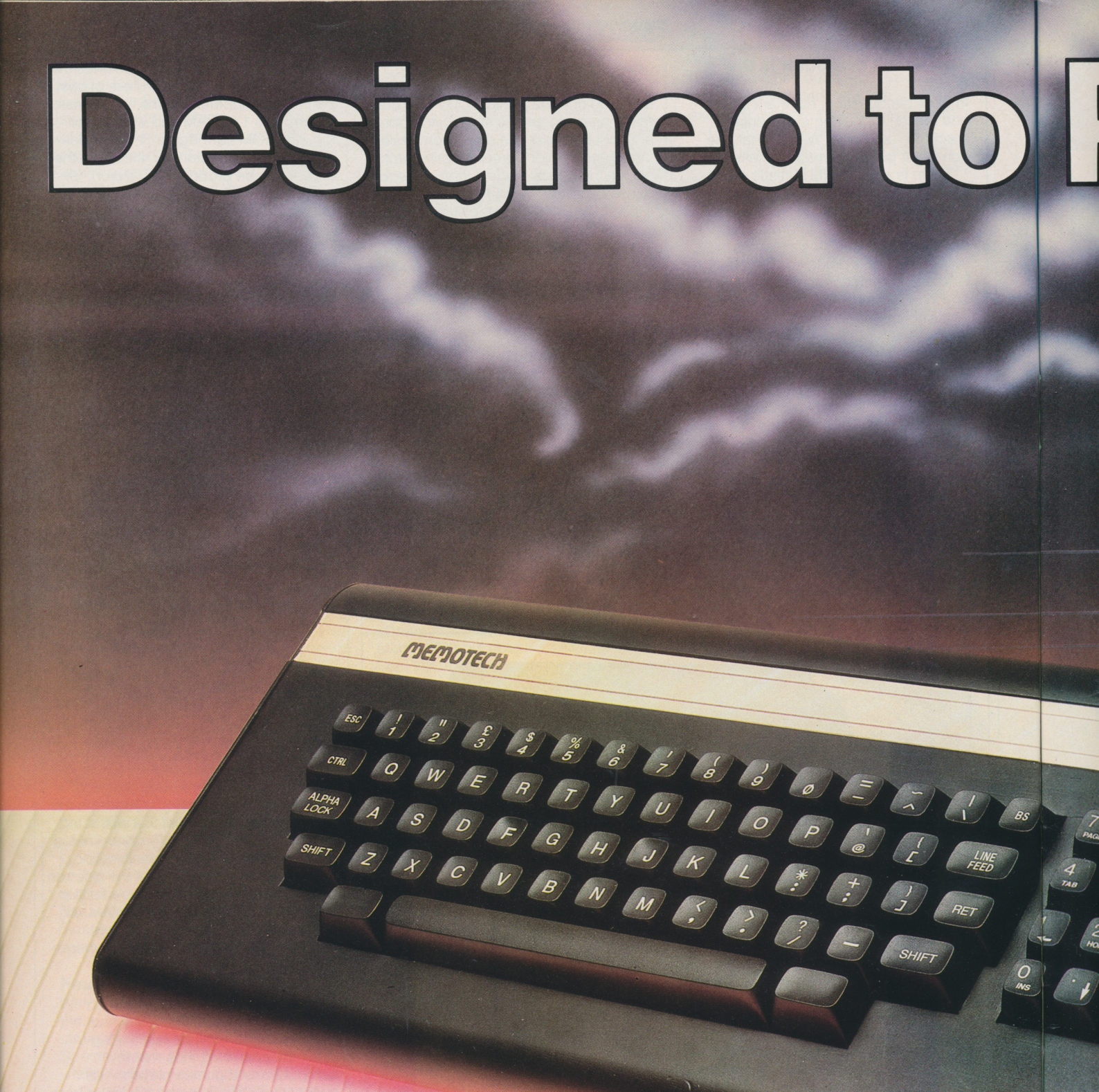
Countdown to Christmas

A lot will happen between now and Christmas and it will be fascinating to see if the new machines – both computers and games players – can successfully break in and take over from the Sinclair's, Commodore's and Atari's.

There is also a software battle in progress. Who will win? Atari is doing software for other machines. So is Mattel. Colecovision is scooping up Atari's titles for its own machine. And nearly all the independent software houses in this country are expanding the range of machines that they cover. Psion and Imagine are expanding to include the BBC; Rabbit and Audiogenic the Spectrum; Quicksilva to include the VIC and Dragon; Bug-Byte, the Oric, and Salamander is exploring the Spectrum and Oric.

Everybody is making sure that they will be producing material for whichever machine comes out on top.

Designed to



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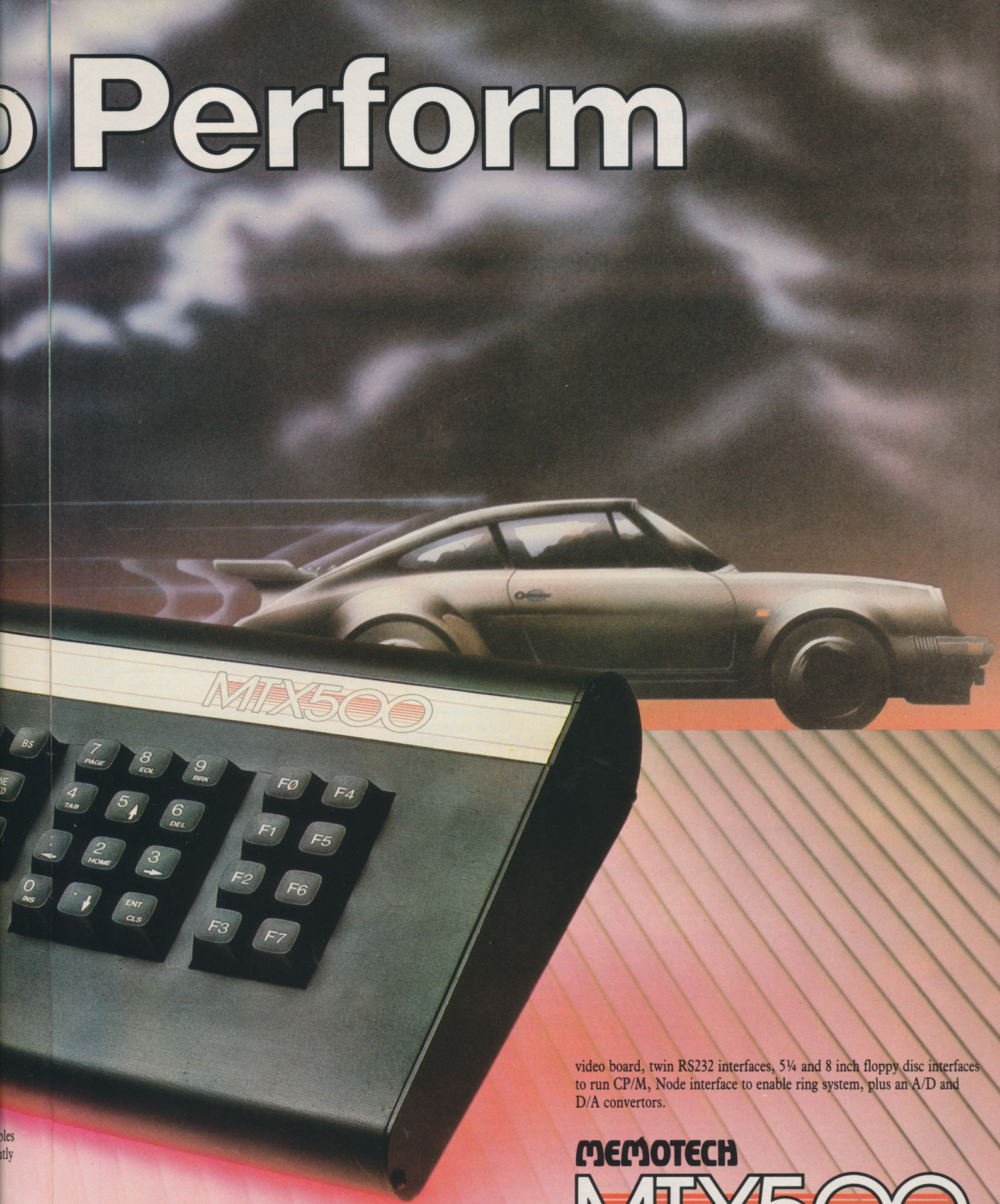
Software

The MTX500's 16k ROM contains several languages and routines which enable the novice or the experienced programmer to make full use of the machine. Standard languages are MTX BASIC, LOGO and NODDY. ROM routines include an ASSEMBLER/DISASSEMBLER with screen display of the Z80 CPU registers, memory and program which can be manipulated from the keyboard. Machine code programs can be stepped through one instruction at a time, and easily called from within BASIC programs. A further feature is the Virtual Screen facility which enables the programmer to define sections of the screen to work independently whilst maintaining all full screen facilities. Pascal is available as an add-on ROM pack.

Hardware

As standard – 32k of user RAM expandable to 512k plus 16k of dedicated video RAM. Sixteen colours, 40 column text, 256 × 192 high resolution graphics with all sixteen colours available and easily moveable user defined graphics (Sprites) combine to make effective screen displays quick and simple to achieve. Standard outputs are centronics printer

o Perform



port, two joystick ports, an uncommitted I/O port, 2400 Baud Cassette port, separate TV and Video Monitor ports, 3 voice sound with hifi output plus a dedicated games cartridge port. Other standard features include the Z80A processor running at 4MHz, real time clock, full moving key keyboard with 79 keys including eight function keys and separate numeric pad. Optional expansions include 80 column colour video board, twin RS232 interfaces, 5¼ and 8 inch floppy disc interfaces to run CP/M, Node interface to enable ring system, plus an A/D and D/A convertors.

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COMPETITION RESULTS

In May we sent your imaginations into overdrive with the challenge 'how would *you* make personal computers easier and friendlier to use?'

As ever you responded with enthusiasm and originality something (perhaps!) to do with the TI99/4A generously donated by Texas Instruments as the first prize.

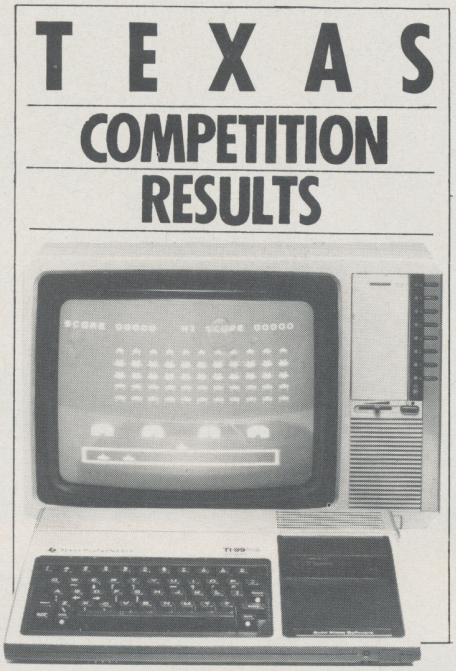
Judging by the number of entries, manufacturers really should don their thinking caps in a hurry on the issue of user friendliness; it certainly is what the not-so-silent majority want.

As usual, judging criteria were the big three: originality, imagination and feasibility. But to cut a long story short, and to ommit the tale of the editor's black eye, the results were as follows:

1st J. Smart of Hitchin who will receive a TI99/4A, and one year's free subscription to *Microcomputer Printout*. The two runners up, who will both receive a years free subscription, are Martin Richards of Kidderminster and Philip Chandler of Alston, Cumbria.

To the many other entrants, commiserations, but we hope to hear from you again in future competitions.

The winning entry printed opposite shone in the light of all three judging criteria, and we will be watching with interest to see which manufacturer introduces the idea first.



THE WINNER

My idea for making home computers more user-friendly is to improve the keyboard.

Instead of solid plastic keys, these should be formed as liquid crystal displays, so that the characters are black or white symbols on a coloured background, which can be changed by the control keys.

For example, when caps-lock is pressed, the lower-case letters change to capitals: when the shift key is pressed, the default characters change to the shift characters: and when the graphics select keys are pressed the characters change into the default graphic symbols. Each mode could have a different background colour for added help.

In particular, the special function keys should be larger liquid crystals. In default on power-up these keys should show the most commonly used commands of the program in use. If BASIC, the most commonly used reserve words would be allocated; if a word-processing package then the most used commands would show for maximum use of one-key commands, and so on.

When defined by the user, these larger keys would allow complex functions to be displayed.

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NINE NEW COMMANDS ARE NOW AVAILABLE

***Clear**	**Quickly and easily erases an entire disc**
***Format**	**Formats drive 0 to 3 in either 40 or 80 tracks**
***OPT2,n**	**Alters the number of sectors per track to n**
***OPT3,n**	**Alters the number of tracks per disc to n**
***OPT5,n**	**Sets the start address of the DFS buffer (see OPT7)**
***OPT6,n**	**Provides control over which part of the file spec. will be displayed ie. only display directory and program length, or just display drive and load address etc**
***OPT7,n**	**Sets the length of the DFS buffer**
***OPT8,n**	**Allows 80 track drives to read 40 track diskettes**
***SYS**	**Selects either Acorn mode or Extended mode**

There is a built-in formatter which will format in either forty or eighty tracks in both modes of operation. This formatter also allows for user definable parameters to be included for the development of software protection.
With this disc filing system a user definable buffer can be used while compacting the disc. This will enable disc compacting to be carried ot without overwriting any programme in memory. Alternatively a new disc may be formatted without any resident programme being overwritten.
This DFS also allows for the use of wildcard characters, using either the symbol for a single wildcard and the * character for multiple wild characters. (e.g. CHAIN P* could be used to chain a programme called PRINTER as long as there are no other files whose names begin with P).
Has many friendly features such as assisting in transfer of cassette files to disc. This DFS is totally compatible with Econet etc., and is complete with a utilities disc and comprehensive manual. The utilities disc contains many useful programmes including machine language printer screen dumps in all modes, including High Res. (Epson & NEC 8023). It also has a nibble editor to scan discs, read data, edit them, and then write back to the disc.
Also included is an eight way DIL switch which may be used to select the start up options these are:

Link 1,	**Determines if the system starts up in 40 or 80 tracks.**
Link 2 & 3,	**Selects type of drive ie. Shugart, Canon etc.**
Link 4,	**Select Acorn or Extended mode at start up.**
Link 5,	**Select auto-boot or not, on "break".**
Link 6-8,	**Select screen mode on start up, ie. mode 0 to 7 etc.**

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ON THE B·SIDE

A Rock album has now been released which features computer programs on the B side. *Richard Pawson* interviewed one of Britain's top record producers, who's also something of a computer expert.

Whether *Get Out of London* – a single shortly to be released by a young band, Intaferon – makes it to No.1 or not, it is a piece of advice which their producer has already followed. Martin Rushent's recording studio (the company styles itself *Genetic*) is situated in the extensive grounds of his Berkshire home, with a panoramic view of the Thames Valley.

Yet the studio and its principal is probably the most sought after outfit of its kind in the country. Saturation booking for several months in advance permit the enormous daily charges – though it seems that most sessions barely get started before 2 o'clock in the morning! Martin Rushent has had hits in the charts for 51 of the last 52 weeks, and from his studio have come many of the top bands: The Human League, Altered Images, Madness, Dexy's Midnight Runners....his walls are covered in Silver, Gold and the only two Platinum discs awarded by the British Phonographic Institute.

Star Wars

But more than his ability to 'pick a winner', Martin Rushent is known for the clarity and originality of his sounds, a product of his unparalleled grasp of computer-controlled synthesisers and recording equipment. His studio looks like something out of Star Wars, with the mixing desk alone taking on aircraft carrier proportions.

When I interviewed him in the quiet splendour of his house, however, he seemed a most unpretentious and unassuming man. Coming across as an ex-hippie, (he didn't actually call *me* 'Babe', but I suspect that he would have done after a few hours) he is laid back in the true sense of the phrase – before it became a fashionable pose. He is only slightly miffed that he has been pipped at the post by a competitor on the idea he has been working on for months – putting computer software on the back of music records and tapes.

The competitor is EMI, with a single record by Chris Sievey which contains a song called *Camouflage* on one side, and some programs for the Sinclair ZX81 recorded on the other – specifically two computer games and the lyrics of the song.

Martin's idea is slightly more ambitious. As I am talking to him, he is putting the finishing touches to a new album from Pete Shelley (formerly of the Buzzcocks) called *XL1*, which is to be released under Martin's own label, *Genetic Records*. The last two tracks on Side B are really 'programmes' (Sic) for the 16K Sinclair Spectrum – which produce colour graphic displays, and the words of each song, in synchronisation with the music.

"Synchronising the words with those on the record was the main problem. After you've recorded the program from the disc onto cassette, and then loaded it into the computer, you have to press any key on the Spectrum's keyboard when the music starts. We've allowed for the fact that the average person takes about a second to react."

Timing Loops

If you can get the timing right initially, the words will stay in sync for the whole side of the LP, simply on the strength of timing loops within the program. Having tried out a copy of the album, I must say that I was less than impressed with the rather simplistic graphic displays, though squeezing all the lyrics and five different programs into just 16K of space is no mean achievement.

"When we first saw the results," says Rushent "we were pretty amazed. Now we realise we've only scraped the surface of what's possible – but we still expect a lot of people to buy *XL1* for it's novelty – certainly, as many Spectrum owners as Pete Shelley fans!"
Henceforth, all Genetic records will have some sort of program coding incorporated. "We're already working on a low-cost device that can filter out some timing signals from within the music, and interface with the computer to control the execution of the program". This would open up all kinds of exciting possibilities, including "interactive video games that work in time with the music". Rushent is setting up a dedicated team of graphics experts to produce effects that are limited only by computer hardware, he says.

"The concept of music growing into a multi-dimensional form has been on the cards for years. Our objective is to provide an alternative to promotional videos - which are of course limited to filming real events and situations."

Clearly one of the main problems will be the many different computer formats – at present, Genetic are sticking to Sinclair as being the single most popular system. "But computer manufacturers will ultimately have to standardize their formats – just as VHS has emerged as the most popular video system. It's already happened on business systems, hasn't it?"

"I personally believe the Japanese will make the decision for us. It can't be long before televisions come with a personal computer and a megabyte of RAM built-in. Whatever format they choose must become standard."

Model Railways

A lot of this thinking derives from Martin Rushent's own interest in synthesisers and computers. "Most 8 to 14 year old boys have an interest in model railways; some keep it up throughout their lives; others replace it with other things. Our model railway consists of synthesisers and computerised drum kits."

The 'our' is significant. Genetic's strength seems to spring from their being a small team, who without the constraints of a large recording company can explore new horizons. "All of us are musicians. All of us can program in BASIC," says Rushent (who bought one of the first 2001-8K PETs – hands up all those who can remember the small keyboard!) "and all of us can operate each one of the synthesisers. It sometimes amazes me the amount of information our human computers, the brain, can store."

He's got a point there – the Genetic studio contains a total of nine different synthesisers and computers, each one of which uses a completely different programming language, never mind dialect! Martin has written some programs for his new 96K PET that will convert some of the coding from one synthesiser to another. For the new studio he's building, he called in consultants to see if it were possible to design a common bus system throughout the studio whereby all the equipment could be controlled from one central console, he fancied a Sirius, which by way of an afterthought would also do the company's accounts! But this is one dream which it seems must remain a dream; the all-to-familiar problems of inter-manufacturer non-compatibility have defeated him.

High Tech

How then, does he go about writing music for this panoply of high-tech instruments. "We've found that you can't improve on the conciseness of the traditional musical stave for the melody, and after all, it's tunes and words that sell records – not clever tricks. But there's no way of defining on paper the timbre of the multitude of sounds we can produce on our synthesisers." Genetic uses its own kind of music paper – with printed staves and boxes underneath for control codes for the *Microcomposer*, starting point for most recordings. The PET is invoked to translate for the Fairlight, Synclavier or whatever (see Computer Music in *MicroComputer Printout* Mar '83 for a full explanation of the capabilities of these incredible machines). Synclavier themselves have now developed a system whereby musical notation can be written directly onto the terminal's screen using a light pen, and then play the music directly.

The hard work starts, however, when it comes to putting a sound or timbre to the melody. The capabilities of any one of the machines is near-infinite. The Synclavier, for example, can read any sound, from a glass breaking to a gunshot, digitize it onto Winchester disk, alter the waveforms in any required manner, and then provide a scale for that sound which can be played on the keyboard.
Martin Rushent generally takes about a week to "mix-down" a single track from an album or single in this manner. To an outsider, however, it may seem unlikely that anything is ever achieved when you are faced with an almost unlimited choice of things to do. "It doesn't work that way" maintains Rushent, "You have to know where you are going before you set off. If I want to drive to Aberdeen, I plan my route with a roadmap and stick to it. I'd never get there if I went off to explore every pretty country village I see on the way."

"Having more and powerful machines simply enables us to get closer to the sound which the songwriter originally had in his head. Contrary to laymens' opinion, each synthesiser has a totally different sound and feel to it."

Pop charts

Even so, many of the newer records entering our pop charts are comprised mainly of synthesised sounds, with perhaps a couple of vocal or lead guitar tracks superimposed. The metal-and-skin drum kit has been rendered nearly obsolete by something called the Linn Drum – which can produce any set of rhythms and sounds to spec.

Which raises the question: are these devices musical instruments or not? In the case of the Synclavier the Musicians Union has pronounced the answer to be 'yes', which as Martin related to me, faces them with some intriguing dilemmas. Apparently, when bands appear on Top of the Pops and mime to a backing track, Union rules state that the number must be re-recorded in the TV Studio especially for the event. Now a Synclavier has the facility to digitise up to two minutes of complete sound (including vocal tracks), store it on Winchester disc, and reproduce it at the touch of a single button.

Pressing a single button on the Synclavier, is technically "playing an instrument", whereas pressing PLAY on a tape recorder is not, and the former produces the better quality sound. How long, one wonders, will it be before the M.U. cottons on to this convenient loophole?

The problem will only get worse – if that's the way you see it. "At the moment," says Rushent "if I want a sound like the London Symphany Orchestra, I go out and hire the LSO. But in five years time, the hardware and software will have advanced so much that I may not need to do that." Rushent himself has already pushed forward the State-of-the-Art so far, that it would take years for a newcomer to catch up with him - which bodes well for his own financial security.

Folk Instrument

In defence, he points out that "synthesisers are now becoming the folk instrument of the 80's just as the guitar has been for the previous three decades. You can buy a machine for around £30 which can outperform synthesisers of fifteen years ago costing thousands of pounds. The same goes for the newest home computers with their waveform-shaping and multi-voice sound output".

The fields of computing and music are starting to overlap in many different ways. Record producers Thorn-EMI and VIRGIN are now publishing home computer software, and several other software firms now produce a weekly analysis of the best sellers, in true Pop Chart fashion. "Record distribution is undoubtedly the best medium for home entertainment software," says Rushent.

In one area alone do they differ markedly – terminology. In the computer business, we frequently analogize hardware to record players and software to music. In the record business, *software* means the record playing equipment people have at home, whilst *hardware* is the studio recording equipment. That together with the quaint spelling of 'computer programme' on the Pete Shelley album, makes me think there is still some way to go before computers make musicians completely redundant. Either way, it looks like Martin Rushent will come up trumps.

Pete Shelley (above) is the artist chosen by Martin Rushent (right) for the first full-length album to feature computer programs. Martin's mixing desk looks like something out of Star Wars, with no less than nine computers and synthesisers sharing the studio.

THINKING OF EXPANDING?

Many people buy a personal computer to learn programming or play video games – with a view to running a useful application later. But to help run a small business at home, or manage the club's membership for example, the computer will need both good software and the right peripherals.

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If you're dealing with large programs or quantities of data, then a disk drive is essential for speed and capacity. The Commodore 1541 disk unit can store 170K and is compatible with other Commodore systems. And because it contains its own controller, you simply plug it into your VIC or '64 and it works.

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The VIC and '64 work with ordinary TV sets, but a colour monitor gives you even sharper text and graphics – without interrupting family viewing. The Commodore 1701 offers outstanding resolution on a 14″ screen.

Commodore 1701 colour monitor £230

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Commodore personal computers will interface easily to most printers on the market – we don't believe in restricting your choice. We do, however, offer our own range of 3 printers designed to bring out the best performance of a VIC or '64, at a very good price.

The 1525 is a tractor-feed model which prints at a speed of 30 characters per second on a full width of paper. In addition to being suitable for program listings or invoices, the 1525 can reproduce the full Commodore graphic character set and a variety of other 'special effects'.

Commodore 1526 printer £345
Commodore 1525 (not shown) printer £230

The 1520 is a four colour printer/plotter that's ideal for drawing graphics, pictures or diagrams. Text can also be printed in large or small type up to 80 characters per line. At a very low price, the 1520 perfectly compliments the advanced features of a Commodore 64 or VIC 20.

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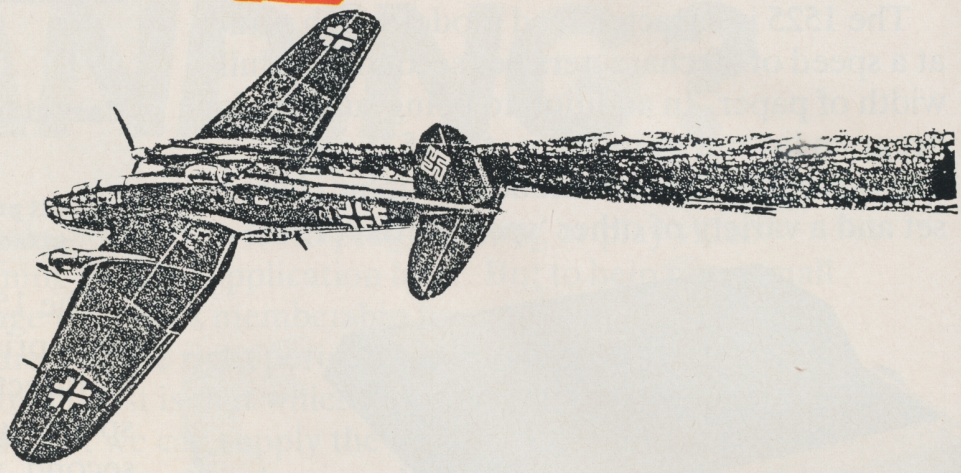

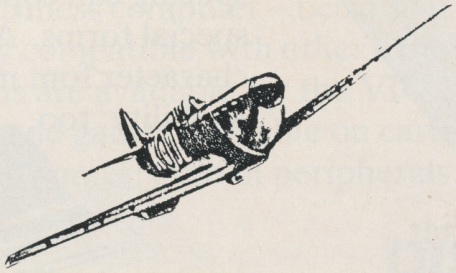

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EXPERT'S CHOICE

VECTREX

The VECTREX is a dedicated video games system with an incorporated screen selling for less than £150. But as *Richard Pawson* explains, it has one important feature – vector graphics – which is likely to start a major trend in home computer design.

I have always fancied the job of Motoring Correspondant in preference to reviewing computers. The deal, if I understand it correctly, is that they lend you the latest Ferrari or Lotus for 6 months or 6000 miles or whatever, and all you have to do is write up your impressions of driving it.

As a computer reviewer it is true that one ends up with some pretty nifty pieces of kit adorning the dining room table, but one also ends up with a lot of hassle to boot. To start with the telly's got to be moved; and re-tuned. Then there aren't enough 13A sockets nearby to cope with the various attachments. One of the connecting cables is missing. The printer is set to a different Baud rate to the computer, and even when the whole thing *is* working, it takes three days of exploration to ascertain the existance of a function that should have been in the manual.

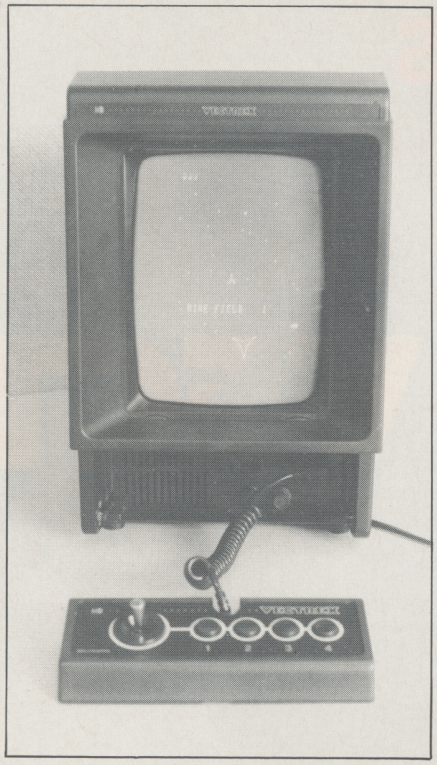
At the best of times, computers come off second to Ferraris in terms of, er, social value. But when micros look like some Heath Robinson lash-up with 'three platefuls of spaghetti coming out the back' it only seems to confirm one's guest's opinions that computers are strictly for the technically minded.

My review of the VECTREX, therefore, broke new ground in three distinct ways. First, because from opening the box to using the VECTREX took less than two minutes. Second, because the whole review lasted a couple of hours, not days, and third because everyone who saw the machine in my flat wanted a go – and unlike Ferrari, it doesn't cost a gallon of petrol for every twelve miles!

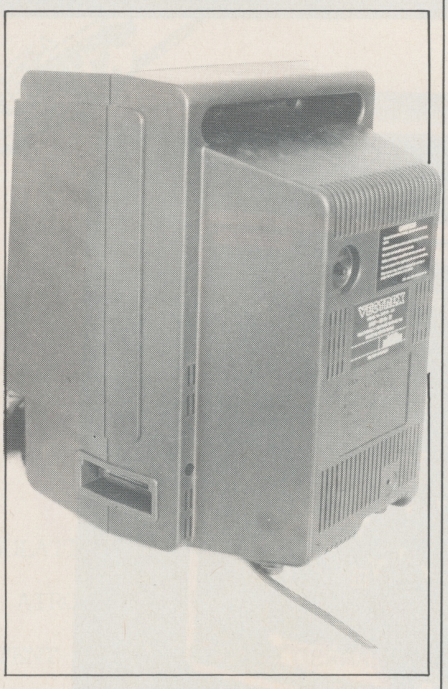
Crystal Balls

But to be fair, the VECTREX isn't really a computer – it's a dedicated video games system, and as regular followers of the *MicroComputer Printout* Crystall Ball will know, the days of such systems are strictly numbered. The reason we've devoted so much space to this one is that it won't remain just a dedicated video games system for long. And more important it incorporates some radical new features which are likely to start a trend amongst the true home computers. So lets begin with a look at its current design and function.

The VECTREX is a completely self-contained games system – it includes the screen, games controls, and mains transformer, so that the only thing projecting from the main console is the single mains lead and plug. The quality of construction is very high; the tough moulded black plastic casing incorporates a neat carrying handle. The result is that the VECTREX can be used anywhere in the house, without a major wiring job or the disruption of family TV viewing, and can easily be carried around to a friend's house or, perish the thought, on holiday. My first PET 2001-8 computer had the same sort of funtionality – every machine I have had since seems to have taken a retrogressive step from a design point of view.



The control panel can be secured underneath the screen, which together with the handle built into the casing makes the VECTREX very portable.



Games for the VECTREX come in the form of the familiar ROM cartridge, which plug into a slot on the side. Games are played using a control panel which links to the main console via a telephone-style coiled cable, and which stows away very neatly and securely under the screen when not in use. The control panel sits very securely on the table-top with rubber feet, and the controls themselves have a very good 'feel' – four buttons whose functions are defined by the game being played, and a spring-loaded variable position joystick.

There is a socket for connecting a second control panel, for two player games, but apart from Volume and Brightness knobs and a Game Reset button, nothing else clutters up the exterior of VECTREX. These are all features which computer manufacturers would do well to take heed of. Another favoured point is the game *Mine Storms*, which is built into the machines system ROM and starts automatically unless a cartridge has been plugged in. For my money, *Mine Storms* (which is not unlike the arcade game *Asteroids*) is better than many of the cartridge games sold for VECTREX, and to have it built-in is a step forward in both user-friendliness, and marketing technique.

Vector graphics

But the most significant difference between VECTREX and other systems is that the screen makes use of *Vector graphics*, from which the product name is derived. It is a measure of the originality of this idea that few computer buffs will know what the term means, let alone the man in the street. If this applies to you then read the separate panel without further ado.

Clearly this has presented something of a problem to Milton Bradley, the board games and children's educational toy manufacturers who bought out the rights to VECTREX. The glossy brochure makes no mention of vector graphics, prefering to major on the ability of VECTREX to play the same standard of games which you will find in the coin-op arcades. This they can claim with a great deal more conviction than their competitors, partly because of the machines high standard of design and construction, but chiefly because it is the vector graphics technique which creates the effects in games like *Asteroids* and *Battle Zone*.

However, it should be pointed out that coin-op arcade machines actually contain far more sophisticated electronic hardware than your average home computer. 16 and 32-bit microprocessors with dedicated mathematics number-crunching chips are standard, and it is not uncommon for an 8-bit microprocessor of the type on which the VECTREX is based, to be used solely for the sound effects. Furthermore, a great many more man-hours have gone into the development of software for an arcade machine, than for a twenty-pound cartridge.

For the VECTREX, the current range of software is not really a credit – a couple of dozen rather average games of the Zap...Ping genre. As the panel explains, vector graphics is ideal for producing 3D images – yet precious few of the games made use of this. The screen is purely black and white, which to my mind is no great disadvantage – I have frequently criticised games designers for concentrating on gawdy colours rather than fine graphics, and for quantity rather than quality of sound effects. Each VECTREX game cartridge comes with a translucent coloured overlay for

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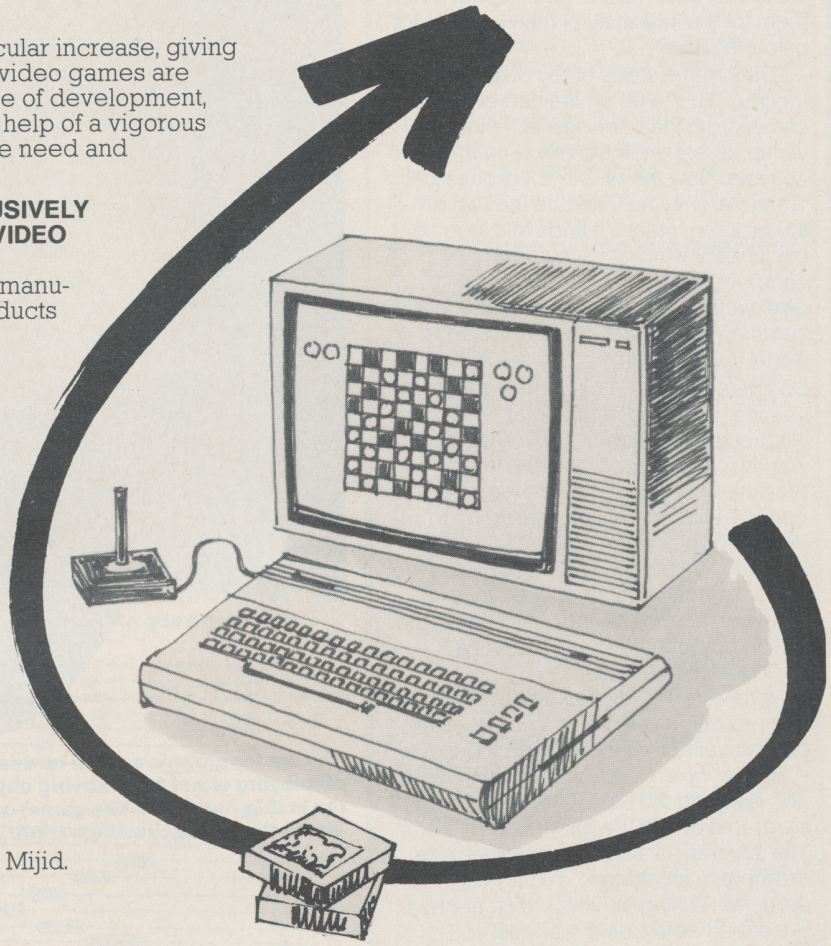

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the screen to provide some variation in colour. I found it just gave the game the kind of tacky image associated with the hand held electronic games – and preferred to play without the overlays.

Protectionism

There are signs that better software is on the way, though not from the usual sources because Milton Bradley seem hell-bent on ensuring that they are the only ones who can produce software for the VECTREX. I do not for one moment agree with this market protectionist attitude (the consumer is the one who loses out) but I have to take my hat off to them for the ingenuity of their solution for enforcing it:

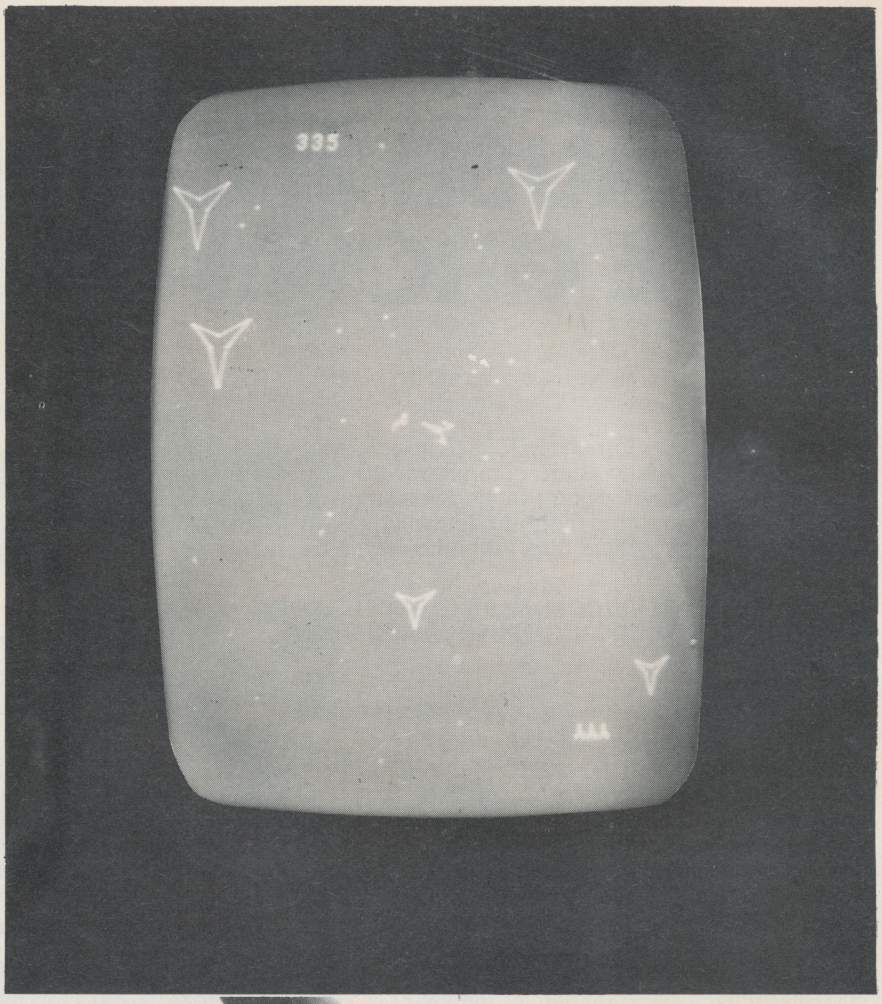
Every game starts off by displaying the VECTREX logo on the screen, which comes from the cartridge ROM into the vector screen memory of the main console. Now the VECTREX processor will apparently not execute the rest of the program unless it finds this logo on the screen, which it presumably compares with a similiar pattern in its own system ROM. And to reproduce a company's logo without permission is illegal. Clever, huh?

Do I detect a flaw? I have no legal training, but I understand that electronically produced evidence is inadmissible in court, and the image on the screen is the *only* evidence of any crime. It will certainly be interesting to see what happens when the first software company tries it on. The VECTREX is too good a machine to be spoiled by a software monopoly – nor will it sell in the deserved quantities until there is a decent software base.

Milton Bradley did let me have a peek at a prototype version of a program they haven't yet announced called, I believe, *Animator* which really was mind blowing, and involved the use of a light pen which plugs into one of the game control ports. The program is a utility to produce line drawings – anything from diagrams to cartoons – using vectors which behave like stretchable elastic bands if you choose to move a point. Phase two of the program allows you to create a drawing and then make any number of alterations to it, with the computer remembering each change. Pressing a single button, will re-create your efforts as a series of frames, with the action smoothly interpolated between each frame. We managed to produce an elegant little animated cartoon of a stick man chopping wood in just a couple of minutes.

Programming Language

It would seem a logical progression for MB to market a cartridge for designing your own simple games – which would be far simpler using vector graphics than conventional pixel graphics. From here on in one is talking about programmability and therefore a programming language such as BASIC which would open up a whole new realm of graphic output. MB are already talking

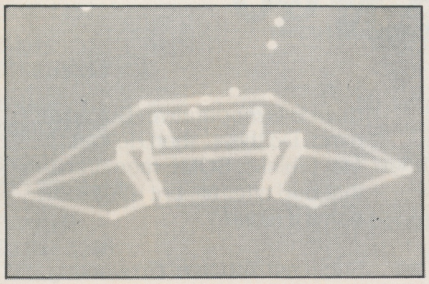


The vector graphic screen is ideal for displaying either fast-moving objects (as in this Asteroids-like game) or three-dimensional line drawings (right).

about a keyboard to plug into one of the controller sockets, and by the time this article has appeared one may have been announced in the states – that and a funny shaped box that would allow the screen to be viewed on its side for full 80 column text.

Now you may well be skeptical about such vague promises – Intellivision talked about a keyboard for their unit for over two years, and one for the Atari VCS never got further than rumour. But I suspect that the VECTREX keyboard really will happen – and soon. After all, MB don't have their own computer to compete against, and at least for a short while the VECTREX has several desirable features which you can't get on a home computer.

Yes, give me the choice of a full-colour TV screen using pixel graphics, and a computer with a built in monochrome vector graphic display with plenty of 3D software, and I'd go for the latter any day. But give me the choice of a Ferrari and you can have all my computers for the asking....



The centre-sprung joystick and four game buttons give the VECTREX that much-sort-after arcade machine 'feel'.

WHAT IS VECTREX?

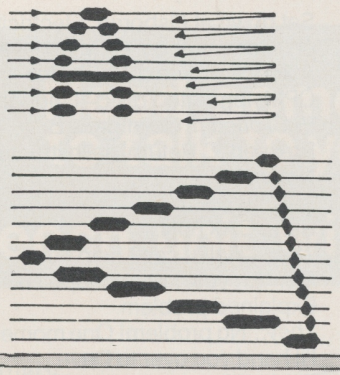
Most computer screens, whether in the form of a built in VDU, an external monitor or your own TV set, work by means of what is called a *Raster Scan*. An electron beam continuously scans the whole of the screen, as a series of horizontal lines, increasing in intensity to make the bright parts of the image to be shown. On a domestic TV screen for example, the picture is made up from 625 such lines, which are scanned in succession, the whole picture being 'refreshed' twenty times every second to create a steady image.

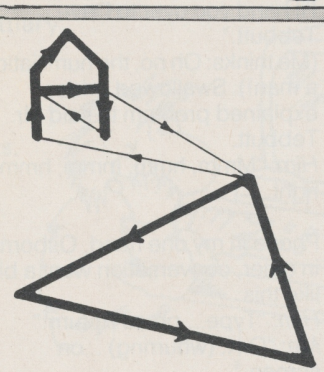
There are obvious problems with such a system, notably that the whole scan has to take place even if there is only a simple, small image in the centre of the screen, and that there has to be a unit of memory for every possible dot (they're called pixels) on each line. In fact it is largely the cost of RAM memory which limits the graphics resolution (the fineness of the dots) on home computers. And without very high resolution indeed, any diagonal lines on the screen will show up as rather jagged steps.

The alternative to Raster Scan is called *vector graphics*, because the entire image is stored in memory and traced onto the screen as a series of straight lines. A vector is simply the mathematical term for a straight line which has a specified length and direction. Any vector, no matter what its length is stored in the same amount of memory, and some fairly sophisticated electronics guide the electron beam to trace out each vector in turn, switching off if it has to jump to a separate image on the screen.

Up until now, vector graphics have only been available on expensive computers used in engineering and design (the flashy images you see on advertisements for computer-designed cars are all done in this way) and on some coin-op arcade games like *Asteroids* and *Battle Zone*. Here's a quick summary of the pro's and con's.

On a conventional system, an electron beam scans the whole screen as a series of lines, increasing in intensity to create bright areas. This is fine for text, but doesn't produce good graphics.





Using vector graphics and a special screen, the image is stored as a series of straight lines, which are continuously redrawn by the moving electron beam. This produces far cleaner diagonal lines, but is not so good for large quantities of text.

Advantages of vector graphics

- *Clarity and definition.* Diagonal and vertical lines come out as true, clean lines, not as a series of jagged steps.
- *Speed.* Simple line images can be drawn many times faster than with raster scan, making it ideal for drawing objects that move about the screen.
- *Memory.* A drawing stored in the form of vectors uses less memory than if it is stored as a series of dots or pixels.
- *Ease of use.* Images can be constructed using less program code – particularly represenations of three-dimensional objects.

Disadvantages of vector graphics

- *Cost.* Vector grahics not only requires a built-in display, but more sophisticated driving electronics as well. Doubtless prices will drop as the system becomes more popular. (The VECTREX is already remarkably cheap).
- *Colour* is not yet available on vector graphics because the electron beam needs to access any part of the screen, and a colour screen is broken up into dots of the three primary colours. One company is working on a new chemical which radiates different colours according to the intensity of the beam. This could produce about four prime colours, but with no mixing or shading.
- *Text* can be produced using vector graphics, but for large amounts it runs slower than raster scan. You can imagine that the electron beam is having to draw each letter, much as you would by hand.
- *Software.* Most programs are written around the pixel graphics system, though this is bound to change if vector graphics increases in popularity.

TYPING TUTORS
A SEXIST APPROACH

"A woman seldom writes her mind but in her postscript." ***Richard Steele,*** **The Spectator.**

By GILL ASPERY

This woman will, here and now.

The fact is, men, that your biggotted, small minded, snivelling behaviour has continued far too long (the word *man*, or worse, the plural *men*, may safely be regarded as a disrespectful term throughout this article).

The truth, widely acknowledged by women from all parts of the globe, is quite simply that we have it over men in every respect, brains, looks..., the lot. Bearing this in mind, I've come to pick a bone.

Tell me why it is that women do all the typing in this world? Hadn't really thought about it huh? What makes it worse of course is that old QWERTY is an absolute disaster (naturally, I hear your wives mutter, it was designed by a man) true, but even from a man you expect a certain minimal level of intelligence.

To be fair – for a while – when the QWERTY keyboard layout was invented certain mechanical restrictions determined that the keys should be well spaced over four rows to keep the steel types, arranged in a semi-circle, from jamming too often. But rumour has it that women still typed too fast. As a final tour de force the alphabet was therefore deliberately arranged to act as a hampering mechanism: *f, j,* and *k* lesser used keys went onto the home keys under women's strongest fingers, and *a* and *y* went to out of the way places.

The tragedy is that this design established the typewriter layout for evermore. Developing technology, golfballs, daisywheels and keyboard buffers have technically removed speed limitations, but did men think to use these innovations, together with the arrival of micros using keyboards to enter data (an opportunity for change on a plate) to reform the layout of the QWERTY. What!... and make woman's life easier, no chance! (Some companies, obviously women-managed, did try to introduce a new layout but would men buy it?) Need I say more?

So there it is, man has been found guilty of lumbering typewriters with QWERTY. What's more, he's failed to find an alternative method of data entry: speech synthesisers, bar codes, laser readers, optical character recognisers, light pens and touch sensitive screens have all been onto the drawing board. They did keep a few men out of the pub for a night or two, permitting a few brain cells to regenerate... a little, but the effect was not obvious. Resigned to QWERTY and the continuing existance of man, I've therefore hit on the only solution. Men – it's your turn to learn to type.

The Software (or rather, the point of this article)

As you'll see from our Buyer's Guide, there's a good range of software available for a variety of micros – so there's no getting out of it that way... But to give you an idea of how they work here are a few of my experiences with CAXTON SOFTWARE's **Touch n' Go**.

9.00 Sat down at Osborne. Electricity on. Computer on. CPM in drive A. Blank disk in drive B. Ran CPM, formatted disk – I thought. Put *Touch n' Go* in drive B. Pressed 'C Return' as instructed. Nothing.

9.04 Rang CAXTON.
They: "Hallo, can I help you?"
Me: "Er, yes, I rather hope so." Explained problem.
They: "No problem! One moment, I'll hand you over to Dave Tebbutt."
(Me thinks: Oh no, the humiliation, a man!). Swallowed pride, explained problem to said Mr. Tebbutt.
Him: "Mmm, hmm, mmm, hmm; right..."

9.10 Phone in my one hand, Osborne in other, conversation went a bit like this:
Him: "Type... press Return."
Me: "O.K. (whurring) ...on screen."
Him: "O.K. Try... press Return."
Me: "Nothing." (Thinks: thank goodness he can't get it to work either.)
Him: "Try... "
And so it went on, and on, until ...
Him: "I'm sorry to say that you're drive B is inoperative. But never mind. Do this..., then do that..."
Me: (Thinks: SOME men aren't that bad after all, but refuse to admit it aloud.)

9.20 Success! *Touch n' Go* working, but Osborne diagnosed as needing help.

9.21 Great fun hereafter!! Decide typing tutors should be listed in the games software category.

Touch n' Go begins by offering the choice to learn either letters or numbers. If you choose letters a menu follows offering a choice of lessons ranging from 1 (the letter 'd') to 61 (paragraph practice using letters from the entire keyboard).

Lesson No. 1

The first challenge demands a row of the letter *'d'* and introduces the use of the space bar straight away. Underneath the programs example you type:

d d d d d d .....

and when the row is complete, press 'return'.

Immediately the computer gives you a score. One for accuracy and one for speed. Before allowing you to pass on to lesson two (*de de de ...*) you're required to achieve an accuracy of 100% and a speed of 30 w.p.m, at which point you receive the accolade, "Well done, you passed the test. Hit space bar to continue."

So on you go, at your own speed, repeating lessons, correcting mistakes, and recalling information using ESCAPE if need be. As each new letter is introduced the program tells you which

TYPING TUTORS

finger to use.

Lessons 1-7 use only the left hand for the letters *D, E, F, T, R* and *A*. Having commenced with a row of: *d d d*, you progress to *de* then *ded*, then *ed*, then *deed*, then *fff*, then *fe*, then *fed*, until the program takes you back for a little assorted practice: *deed edd feet tee fed feed tee teed ted deed*; demanding an accuracy of 95% and a speed of 25 w.p.m.

In this way you quickly establish a typing vocabulary progressing from one letter to two, one hand to two, words to sentences and sentences to paragraphs, and with a score immediately available every time you finish a line the program encourages you to stick at it. The woman standing over you with a shot gun will probably help too.

The idea is super; Typing Tutor programs have got to be the easiest way to learn to type, and when you can type its also the easiest and most enjoyable way to pick up speed. Not only that but if you buy one for the family or the business, then it's also an economic way to learn. All *you* need is the determination not to cheat by using the wrong fingers or to look down at the keyboard while you're typing – the surest way to loose speed *and* make mistakes.

Finally very many thanks to Amanda Oswold and, begrudgingly, Dave Tebbutt at CAXTON without whose help it may have taken me a mite longer to learn to type.

Hands out of your pockets now men, you're next...

Manufacturers/ Distributors	Name of Program	Format	Hardware compatibility	Price inc. VAT
Caxton Software Ltd 01 379 6502	Touch n' Go	disk	Any CP/M Micro	£25.00
Texas Instruments Ltd 0234 63211	Touch Typing Tutor	cartridge	TI 99/4A	£31.95
Iansyst 01 607 0187	Iankey	disk	Any CP/M Micro	£33.35
IBM 0256 56144	Typing Tutor	disk	IBM P.C	£31.05
Peter & Pam Computers 0706 212321	Typing Tutor II	disk	Apple II/IIe	£19.43
Atari 0753 33344	Touch typing	cassette	Atari Home Computer	£19.99
Kuma 0628 71778	Microtype	cassette	Sharp MZ80A	£39.67
Tandy 021 556 6429	Typing Tutor	cartridge	TRS80	£29.95
Softcell 01 844 2040	Mastertype	disk	Apple II	£32.16

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The Pace range of drives include two drives which are switchable between 40 and 80 tracks. As these drives are double sided they give a massive 400 k *per drive* in 80 track mode, whilst in 40 track mode they retain compatibility with Acornsoft and other commercially available software. These dual track drives feature multi-colour LED's to indicate mode selection.
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PSD3	40/80 Switchable Drive 400k		£345	£396.75
PDD1	Dual Single Sided Drives (40 track)	200k	£338	£388.70
PDD2	Dual Double Sided Drives (40 track)	400k	£449	£516.35
PDD3	Dual 40/80 Switchable Drives	800k	£610	£701.50

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Dealer enquiries welcome

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Three Blind Mice

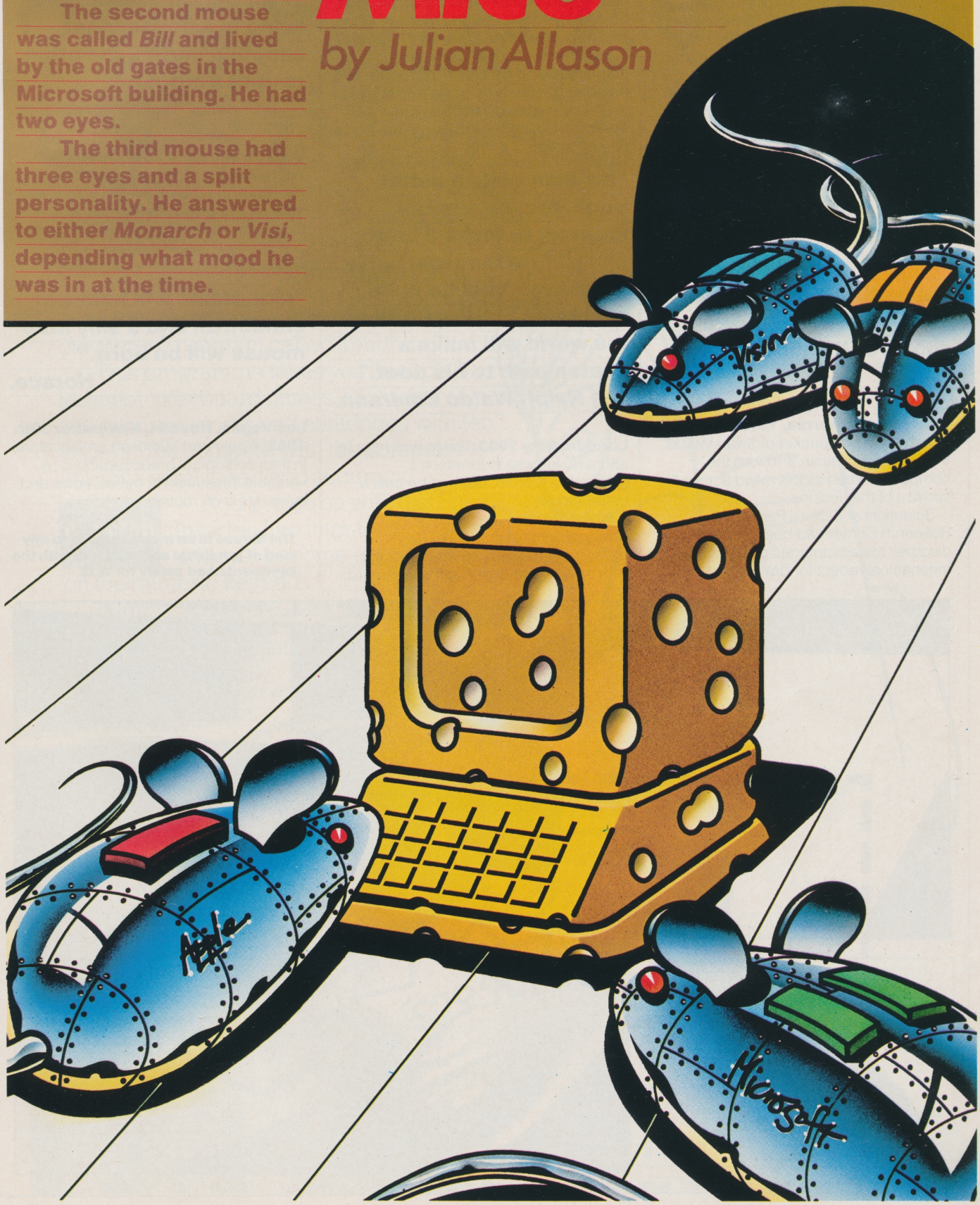
by Julian Allason

This is the story of three blind mice.

The first mouse was called *Lisa* and had one eye. She was a big, expensive mouse with a fondness for apples.

The second mouse was called *Bill* and lived by the old gates in the Microsoft building. He had two eyes.

The third mouse had three eyes and a split personality. He answered to either *Monarch* or *Visi*, depending what mood he was in at the time.



THREE BLIND MICE

Cupertino, California, May 1983. A cat may look at a king, but Steve Jobs, Chairman of Apple, and uncrowned king of personal computing, was looking at a mouse. It was on the front page of one of the Silicon Valley trade papers and he didn't like the look of it one little bit. The order went out to get Gates on the line, wherever he was.

William H. Gates, President of Microsoft Inc. the world's most visible software house, proprietor of what is about to become the world's most visible software mouse, was in London. In fact he was tucked up in his comfy bed at the Heathrow Skyline hotel, with his teddy bear and a cup of hot cocoa. He needed his sleep. Late night customer complaints he needed like a hole in the head.

The substance of Jobs' protestation – that as a major customer of Microsoft, Apple had not received adequate warning of a competitive mouse – underlines the importance the industry attaches to this tiny pointing device.

"In baiting a mousetrap with cheese, always leave room for the mouse."

Saki.

Palo Alto, California, 1973. A plastic box the size of a packet of Swan Vestas, the mouse moves an arrow on the computer screen as it is rolled across the surface of the desktop.

Scientists at Xerox's Palo Alto Research Center had been the first to discover the advantages of the electro-mechanical rodent for drawing on the screen. That had been back in 1973. Now, ten years later, mighty mouse was being touted as a means of overcoming user resistance to the keyboard.

After nearly 300-man years of software development, Apple had parleyed the simple mouse into the centrepiece of an ambitious attempt to reproduce normal office functions on a computer. Looking at the screen of their new *LISA* computer was like looking down at a desk top. Files, clipboards, scissors and paste, all could be displayed and manipulated using the wonderous mouse.

And that was not all. Complex diagrams could be drawn, shaded in and printed out, simply by using the mouse to move the screen cursor over the appropriate symbol and then pressing its *Select* button.

"If a man write a better book, preach a better sermon, or make a better mousetrap than his neighbour, tho' he build his house in the woods, the world will make a beaten path to his door."

Ralph Waldo Emerson.

London, May 1983. Gates was here to add a novel twist to Emerson's celebrated dictum. But had he built a better mouse?

Whilst the very latest designs – personal computers like ACT's impending *Apricot* – had mousetraps and mouseports built into the keyboard, most existing micros did not. Using a combination of snazzy software and CMOS circuitry, Microsoft had overcome this problem. Gates' mouse, *Bill*, could be plugged into the communications port on virtually any micro that had one.

As sophisticated as *LISA*, it wasn't. But then it was only going to cost £140, or £275 with the new *MultiTool-Word* W.P. program.

"Two old bachelors were living in a house: one caught a muffin, the other caught a mouse."

Edward Lear.

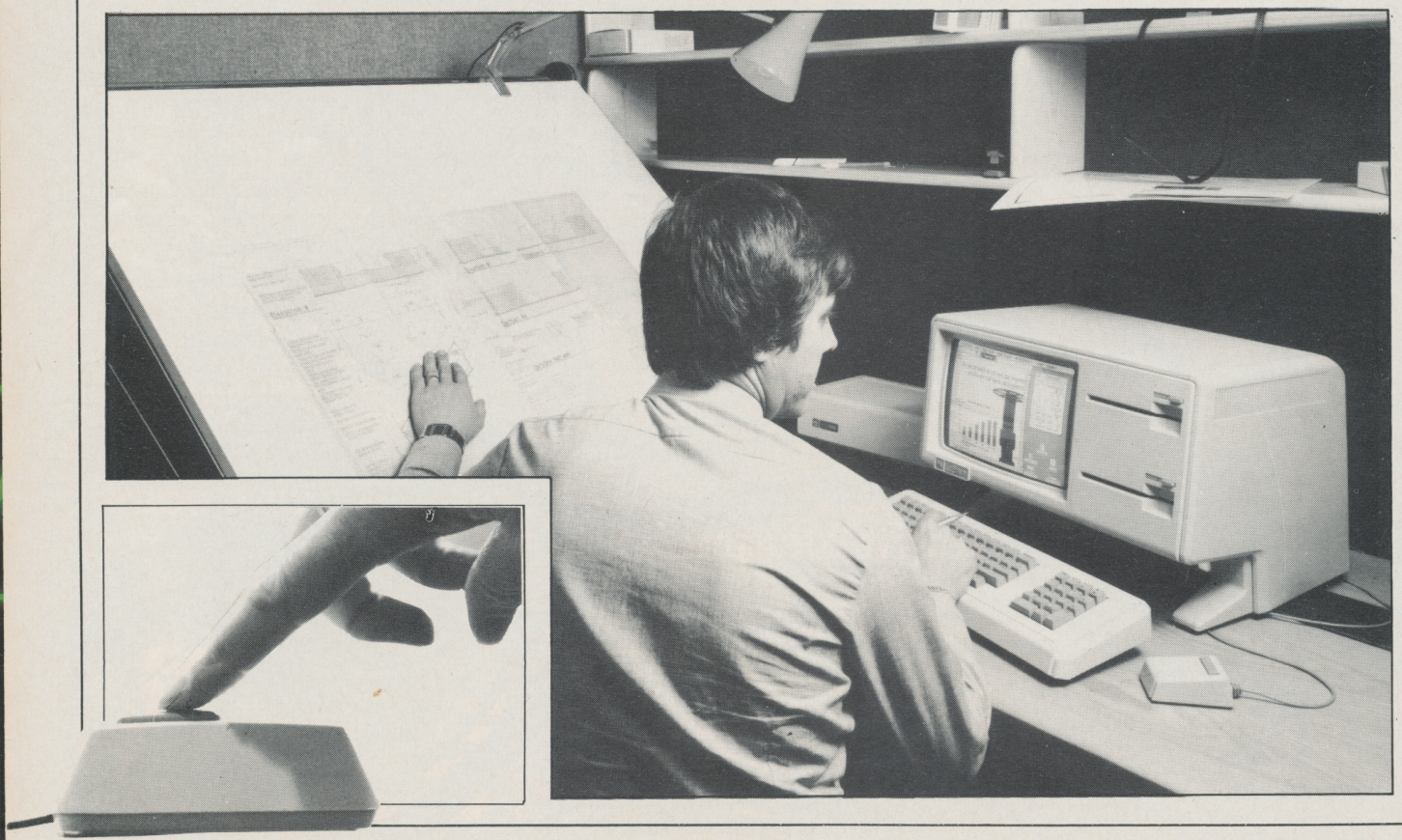
Wall Street, New York, June 1983. With every microcomputer a mouse prospect, the rodent market will be worth millions, according to financial analysts. Quite how many millions, no one is yet prepared to hazard a guess. – *The Observer.*

"Mountains will heave in childbirth, and a silly little mouse will be born."

Horace.

Las Vegas, Nevada, November 30th 1982. Apple and Microsoft are not alone in their zoological preoccupations. A veritable infestation of moles, voles and even rats is *en route*.

The Mouse is an invaluable aid to any kind of graphical applications, with the keyboard used solely for text.



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THREE BLIND MICE

In the corner of a cupboard in Suite 2011 of the Caesar's Palace Hotel, lies a small two eyed mouse. In November of this year of grace, 1982, the suite's occupant, VisiCorp's President, Terry Opdendyk, had demonstrated this self-same mouse to selected representatives of the world's press.

And with it *VisiON* 'an operating environment' which integrated a handful of standard applications programs onto a single high res, multi-window screen.

Few of the journalists had seen *Lisa* at this stage; most were extremely impressed. Apple were furious: "A half baked version of one aspect of one of our future products," snapped an irritated Apple spokesman.

Meanwhile, Opdendyk continued demonstrating *VisiON* on an IBM P.C. plus Winchester disk. Multiple documents on screen at the same time; information exchanged between them using the mouse. It was a revelation: it would be delivered in mid-summer.

"It has been usual to catch a mouse or two (for forms sake) in public once a year."

Thomas Grey on refusing the Poet Laureateship.

Gary Kildall – Digital Research will support VisiOn.

San Jose, California, June 24th 1983. Mid-summer's day is about to dawn and still they're burning the midnight oil at Visicorp headquarters. Meanwhile, the world and his wife have announced mice.

VisiCorp spokesmen do not respond to enquiries about delivery.

An old software law has it that the first 90% of the work takes 90% of the time. The last 10% of the work also takes 90% of the time.

"Not a mouse shall disturb this hallowed house."

Wm. Shakespeare, 'Much Ado About Nothing'.

Pacific Grove, California, May 1983. Gary Kildall, father of CP/M, strokes his mouse. Today it is called *Monarch*. A nice simple mouse, a mouse devoid of pretention. A mouse, moreover, that will link to existing CP/M systems.

The trouble is the number of mice is now fast multiplying towards plague proportions. And that of dreaded rival Microsoft looks as if it might soon be making the running on all four of its furry feet. Firm action is needed. Gary signs the agreement, shakes hands with Terry Opdendyk and signals his P.R. persons to release the joyous tidings.

Digital Research is to support VisiCorp's *VisiON*.

D.R. will work with personal computer manufacturers to adapt the *VisiON* software for CP/M systems. Esther Dyson, Editor of the influential Stateside *RELease 1.0* newsletter likens Digital Research's action in signing up with VisiCorp to 'joining a club that became more worth joining by that very action'. What we would call the Groucho Marx approach to Clubmanship in reverse.

Opdendyk congratulates Kildall on a wise decision. Kildall congratulates Opdendyk on a wise decision. Kildall continues to stroke his mouse.

Yes, *Monarch* is a good name.

"The best laid schemes o' mice an' men gang aft a-gley."

Robbie Burns.

Anaheim, California, April 1983. Ethernet local area network pioneer Xerox, inventors of the mouse, sign up with VisiCorp and interface experts 3 COM to link *VisiON* to Ethernet.

To Xerox, *VisiON* offers a means of offering its Ethernet network to the massive base of IBM Personal Computer users. For VisiCorp, the endorsement of Xerox is a feather in its cap, at a time when the industry is forming up to back one or other of the mouse systems.

"Hickory, Dickory, Dock; the mouse ran up the clock."

Traditional nursery rhyme.

Palo Alto, California, 1975. America's contribution to academic development, the think tank, the original university without students, lives and thrives in California.

In all that sunshine state no thoughts are thunk deeper than at Xerox PARC. Throughout the 70's the nosey Parcers delved deep into the realities of computing, unhindered by the normal commercial restaints that have so distorted the development of the digital computer.

The mouse's seal of approval is awarded with incorporation into the *Alto*, the prototype user-friendly computer. Unfortunately for Xerox – or otherwise they, not Apple, would have swept the board – the technology to build the Alto was not around in 1975. Not quite.

This temporal misfortune led to the redirection of the Alto concept into the

In US magazines, many companies are now advertising Mouse add-ons to existing computers. Trouble is, all of them work in different ways, and no-one can agree on the right number of buttons.

THE WORD ACCORDING TO GATES

The mouse provides a perfect illustration of the major trends in the software market, argues Bill Gates of Microsoft.

According to Gatesian theory, there are precisely five major issues facing software developers. It is their attitude to these questions which will determine their success or failure. The costs involved are staggering. "Apple talks of investing $50 million to develop a complete applications family; Xerox views the job in terms of hundreds of man years... A wrong choice will be costly at best; at worst it could spell financial disaster," says Gates.

Integration has been a byword in the software industry for some time. In most cases, however, this has meant little more than moving data back and forth between different applications programs through what Gates, in a dig at VisiCorp's DIF, Data Interchange Format, describes as, "some sort of low level numeric description".

Gates sees the two real features of integration as the need to capture all data descriptors, and for the whole process to be automatic. On this at least Apple and Microsoft are in agreement that the best solution is to have multiple products that can easily pass data back and forth. "This doesn't mean that the products cannot be priced as a single package or that they can't all be on the screen at the same time," says Gates. "But it does mean that they will be used on different data structures and will use different command structures."

There seems to be fairly general agreement that applications packages should include online HELP files, so that users can immediately call up a piece of HELP text designed for the specific context in which they find themselves. Menus written in standard English, and use of full sentence prompts are also generally accepted, he thinks. VisiCorp, for example, is moving away from the use of coded commands (/) towards the use of English words.

The major area of uncertainty concerns the introduction of a new element, graphics. "The issue is really one of how we present data on the screen. So far we have been fairly confined in how we use the screen to present data. For a long time, we could only put characters, and mono-spaced ones at that, in specific positions on the screen."

The new technology with its use of pixels, bit mapping, and the like brings the freedom to put arbitrary images onto the screen in any form the user wants. Gates cites the use of icons to tell the user what is happening, as a much more compact and compelling approach than using words to say the same thing.

There cannot be much doubt now that grahics are going to become a standard part of all computers. "The software analogue of that is that one year from now, no decent applications software family, no decent language family, and no decent operating system will be without extremely high level support for this type of graphics capability," says Gates firmly.

Apple has already moved towards developing standards for incorporating graphics with its development of a strong operating system on *LISA*.

Gates backs the use of a database metaphor on the grounds that people generally take a database approach in recording and accessing information.

Xerox, on the other hand, uses a linear document oriented metaphor. "It includes different types of frames, text, graphics and so forth but the orientation is still that of a document, which is scrolled through in linear fashion," says Gates.

Apple, he thinks, have adopted a data storage metaphor that is based on placing formulae in cells on a spreadsheet. "Not what you would do if you wanted sales figures for last year," he grins.

Star work-station, all £11,000 worth of it. Nor are *Stars* to be observed singly; they shine as part of Xerox's Ethernet local area network, a not unexceptional installation which might have cost its star-gazing customer a six figure sum.

"Three blind mice, see how they run."

Traditional nursery rhyme.

Cupertino, California, March 1981. The technology arrives. And with it an opportunity for Apple to cut the ground out from under Xerox's feet. With an 18-month lead in software development, who in the micro firmament could stop them?

The world of computer design is a small one, characterised by a high degree of job mobility. Within months of Apple's decision to initiate the *LISA* project, word has leaked out, and under the doors of competitors, both hard and soft; amongst these is VisiCorp, who for complex reasons, were not well disposed towards Apple at this time.

VisiCorp's Chairman, Dan Fylstra, also realised the significance of Apple's software investment, then put at over 100 man years. There was only one way to catch up.

"These mice will never catch on."

Chuck Peddle.

Palo Alto, California, February 1982. In all the annals of microcomputing, there is one scene which, however apocryphyl, will not go unrecorded.

The scene is Xerox PARC. The time early morning.

Enter Dan Fylstra clutching a suitcase. He opens it. It is full of money.

Fylstra (shouting):
"Does anyone here want a job?"
(Stage direction: stampede of boffins.)
End of scene.

Dan Fylstra – a case for money?

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MARTIN HAYMAN'S

PRO FILE ON

In the panoply of microcomputing, the machine itself is undoubtedly the brightest star. It is the most visible part of the system; it is hardware; it can be compared, point for point, with its competitors and some kind of yardstick established as to which is the 'best'. Generally this is reflected in the relative coverage afforded by the welter of magazines vying for the enthusiast's attention.

Only recently has a magazine been launched which aims to cover microcomputing purely from the software angle – one area where, many observers believe, the real money will be made. This is of course an item of faith among software vendors and others who can see that the manufacture of hardware, because it is the least labour intensive of all the economic activities involved in microcomputing, affords the least possible margin to the vendor – and the best opportunity for the user to put the squeeze on prices in the market place.

Looked at another way the machine itself is only the tip of the iceberg. The massive reef of real costs lies hidden from view. For the user, there is little on view to show for the money spent on software and its maintenance, service costs and the reams of paper consumed during the shortish life of a microcomputer.

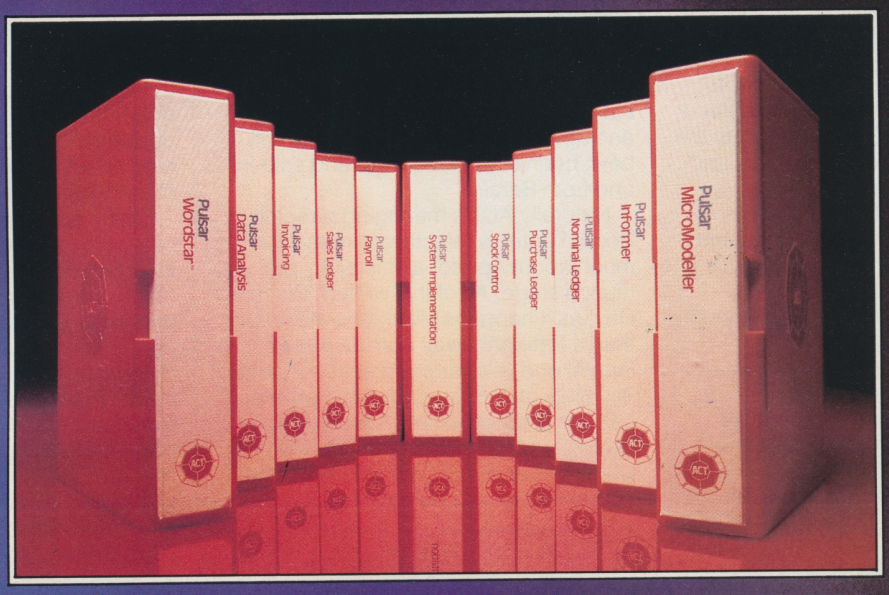
Excellent Pedigree

ACT-Sirius is a company which knows this very well. ACT has been covered widely in the mags particularly for two hardware products, the Sirius, which it imports from the US, and the Apricot, which it is already building for public launch in autumn. Undoubtedly the Sirius micro has attracted publicity not

A new star is born

pulsar

16 BIT BUSINESS SOFTWARE



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only for its own qualities, which are considerable, but for the row about its UK distributorship, of which more later. It offers a similar sort of specification to the IBM PC and other 16-bit machines, and at a competitive price. Its pedigree is excellent: the elegant design comes from PET magician Chuck Peddle, and its marketing by ACT has been astute. It is the sort of product that many companies could make a decent enough living by selling.

Indeed the yearly results ending March 31st, 1983, announced by Applied Computer Techniques (Holdings) plc (hereinafter referred to as ACT) show that Sirius sales made a good contribution to the company's profits. Its profits over the last year were £2,168,000 (up 115%) on a turnover of £22,781,000 (up 172%). Profit, though handsome, is by no means keeping pace with turnover; ACT Chairman Lindsay Bury attributes this to increased investment in "marketing, software development and generally strengthening the competitive position of the group as a whole".

The chairman writes that the "dramatic increase in turnover and profits was largely due to the remarkable success of the ACT Sirius I microcomputer", but this is far from the whole story. The machine may or may not be the best selling 16-bit micro in the UK, but it is far from sustaining the whole group. It represents a good business decision which confirms the underlying trend of the groups activities, which over the last 10 years have grown at 40% compound (and confirms that success in business is about making good decisions all the time, not just hitting the jackpot once).

In that decade ACT has grown from a regional bureau service offering a range of business and financial services, into a broad spectrum computer company which is able to supply the computing needs of just about anyone who might want to use a micro in business, from the time the customer groans and admits that he has to "go computer" to the time, four or so years later, when that computer is demoted, scrapped, turned into a kid's toy or whatever else businessmen do with obsolescent office equipment.

Four-year term

Looked at over a four-year term, the initial purchase price of the machine shrinks in its importance to the company's overall profit performance. To the retailers of boxes, people who come back asking for service, software advice, printer ribbons, floppy disks, office furniture and groovy plants to re-humanize the office are at best a lost opportunity, at worst a nuisance. To the company which, in its various guises, can arrange for all of these things, they are welcome. Such a company is ACT, whose business is business.

It is a sign of the times that such a company is now, with its Apricot project, ploughing its by no means inconsiderable profits into the manufacture of a new, cheap computer which, on the face of details so far previewed, would seem to offer a new standard of price against performance and operational convenience and will have been conceived, built and sold in and from Britain.

Naturally ACT's managing director Roger Foster is reluctant to reveal too much about Apricot at this tricky pre-launch stage. As of this writing (Election Day, as it happens) Apricot is little more than a fortnight away from its dealer launch and wild horses would not drag any hints as to price from Mr. Foster's lips. He is not unwilling, however, to sketch in some of the desirable features which this new machine will boast and illustrate how ACT has got into the

Ed Sherman, Managing Director of ACT (Sirius) Ltd.

enviable position of owning not only a new factory in Scotland, but several other desirable freehold properties in and around Birmingham and still have enough left over to fund the launch campaign to the tune of more than half a million quid in the first month alone. With budgets like this, Roger Foster's new Bentley Mulsanne, parked prominently outside ACT house in Birmingham's prosperous Hagley Road, is a mere bagatelle; and leads one to believe that the notice on his desk, which reads "Spare me your 'piddly-assed' problems" is observed by most who come into that large, leather-lined lair.

Formidable opponent

As Foster warms to the theme of Apricot, he forgets about the stub of a Churchill-sized cigar. He looks and sounds, with his soft lisp and trace of a Midlands accent, more like a kindly GP than the founding father of a company which in 17 years has grown to a Stock Exchange valuation of more than £20m (next year prediction: around £50m) and whose P/E ratio is one of the most favourable currently quoted; but there can be no doubt that he would be a formidable opponent – as DRG found when they tried to cut themselves into the marketing of the Victor-badged Sirius.

Foster says that Apricot will be the first of a fourth generation; he defines the previous three as, first, single-board machines; the second, the 8-bit machines packaged like Apple and PET; the third, the current crop of 16-bit machines among which Sirius does battle: IBM, which Foster claims Sirius outsells in the UK by 2:1, DEC ("a bit of a paper tiger") and Olivetti, who are "saddled with the wrong processor and a unique operating system".

Into this melee he will pitch, on June 29th, the new Apricot: Intel 8086 processor with the new 8089 I/O processor with the extra-cost option of the 8087 maths chip for high-speed number-crunching. The 9-inch screen, by National Panasonic, will offer good resolution. Disks will be Sony's 3½" offering 315K, single in the standard model. Two may be specified, and by the fourth quarter Foster expects to have double density versions, of which ACT already has engineering prototypes, offering 720K.

Principal operating system will be MS-DOS 2.0, plus some enhancements of ACT's own devising such as RAM disk. CP/M-86, Concurrent CP/M and UCSD p-System will equally be available at launch time, and UNIX will follow. It will eventually be networked, probably using the Sirius system, and Foster would like to see full interchangeability between Apricot, Sirius and IBM (wouldn't everyone?) though the engineering decisions on communications protocols are still being worked on.

Mouse tip

Free with the computer will be a "multi-screen relational database" which ACT has spent a great deal of money developing over the last year. Word processing is considered a separate application, and for this purpose Foster favours Microsoft's Multi-tool Word with it's mouse, which is expected to be ready for sale in the autumn. "This is my tip for the top of the world processors for 1984," says Foster. 'Without harping on, I think this is a classic example of a fourth-generation word processor. We shall certainly sell that word processor with the mouse".

Graphics will follow Digital Research's philosophy and though designed for CP/M-86 will run under MS-DOS. The Graphics kernel will come with the all-up price of the machine, but applications packages will be extra.

The machine has a substantially reduced desk 'footprint' and weighs around 16lb – the reduction in weight attributable at least in part to the smaller drives. ACT has attempted to reduce the 'wire management' problems of the conventional micro, but Foster says that the ergonomic disposition of the

The ACT Sirius 1, contributes handsomely to last years group turnover of £22,781,000.

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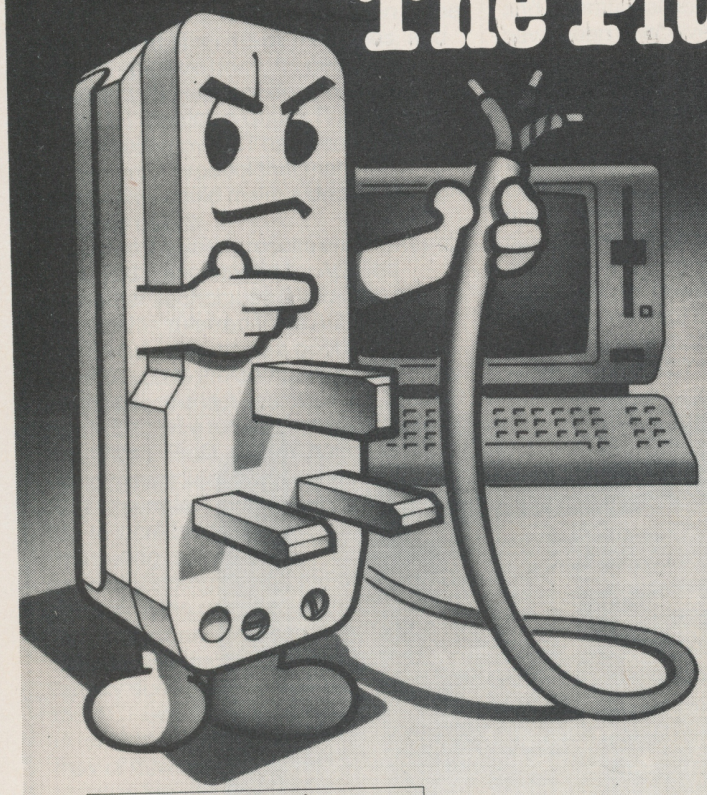

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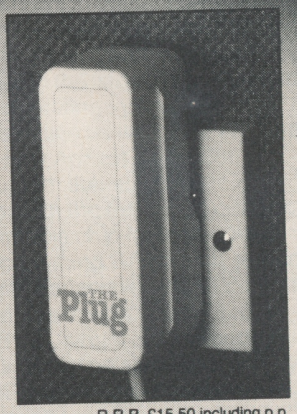

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machine's constituent parts differs from anything seen so far in 'third generation' quasi-portables such as Compaq and Hyperion; but it is not itself portable so much as 'transportable'. Foster feels that the 9-inch screen and microfloppy represent the optimum size for the executive's desktop.

The new miniature floppies from Sony, at 3½", and Hitachi at 3" (which I have not seen) seem to represent a real breakthrough in storage. The Sony device looks much closer to the convential audio cassette and is cased in the same rigid plastics. It has an automatic shutter which permits the disk to be accessed only when loaded securely into the drive, and so is a semi-sealed environment, allowing the disk to be carried around with the minimum fuss in a pocket with no fear of contamination from the usual dust and debris. It might even survive a light coffee spill.

Market Share

"That is the correct way to carry your files around," says Mr. Foster, tucking the bright blue square into his breast pocket. Which of the two "standards" (Sony's or Hitachi's) did he believe would come out on top? "I don't think it matters much who wins frankly – they both could. We went with the Sony because it has more capacity and it is the perfect size for the top pocket. Why bother to go any smaller? I think they'll all get their market share, although of course there's some resistance to it in the US."

"Some people say that at 315K it's a bit mean on capacity but after all, the maximum size for an IBM PC, which is the most successful in the world, is 320K; and the other most successful microcomputer is the Apple which has only 140K."

ACT has bought a factory in Glenrothes, Scotland, to build the machine and has re-equipped it at a cost of over £1m. Up to 400 new jobs will be created in an area which already has a strong electronics infrastructure (Hewlett-Packard, DEC and Wang already have assembly operations in the region) and of course development grants were available, and ACT was not slow to avail itself of them.

This factory will eventually gear up, during 1984, to produce one Apricot a minute, representing a total production of up to 100,000 during next year. The whole operation, into which ACT has so far sunk £10m, is designed and engineered to be the type of high-volume operation which alone, on the world market, can ensure the kind of economies of scale which the Japanese have so successfully achieved. Unhappily, though, the workforce will be assembling largely Japanese-sourced components; when each machine needs 32x64 dynamic RAM chips there is simply no other volume source.

Foster admits that the creation of a 16-bit market sector at a price which significantly undercuts its own Sirius could well impact the latter machine sales at the bottom end. The objective is to bring a 16-bit workstation into the scope of anybody who has a real need for a business micro. "We feel the two can sit happily side by side though I'd be a fool to pretend there won't be some overlap at the top end of Apricot and the bottom end of Sirius. But in principle there is scope for a portable as well as a full desktop machine in this market."

Roger Foster, Managing Director of ACT (Holdings) plc, oversees a model of the company's new factory in Glenrothes.

Selling solutions

"In 1984 you will see a whole range of machines from small to very large in the pesonal computer market," says Foster. "IBM will I think produce a range and I could well imagine that ACT would have three or four machines in each particular range. That's how we see the market developing".

"we need 16-bit machines to run better and more comprehensible software; that's why in the next twelve months we're going to see a complete switch away from 8088s to 8086s. It is just to produce the power: it doesn't perform any faster to the user, but it does enable the software to be much more sophisticated and friendly."

When Roger Foster, or hardware distribution chief Ed Sherman, talk about providing solutions to the customer one is inclined to accord them due respect. For ACT, in its various guises, has been 'selling solutions' for near on two decades and it seems an inescapable fact of life that in the real world of financial and commercial microcomputing, there is little substitute for experience. ACT has of course, made mistakes but as its record of profits growth suggests, it has not made big ones recently. Crucially, it understands that the 'added-value' services which a broad-spectrum company offers are in the long run more profitable than hardware sales. It could even, were the pressure on hardware margins to build up still further, afford to sell hardware products as 'loss leaders'.

Just look at the sort of maintenance contracts offered on the Sirius: £480 for the basic 128K machine with 1.2Mb for two years, if you sign up within a fortnight of purchase; £600 if the need for support occurs to you only later. Printers are a separate issue. These are not the sort of costs which computing amateurs are likely to welcome.

Software experience

But it is essentially in software that ACT's experience pays off. It was originally a bureau service running batch processing of financial data, and its software has been steadily honed over the years by day-to-day use and the undoubted need to provide solutions. It still offers bureau services from its mainframes in Halesowen and Bristol, though the relative importance of this part of the company has declined. But as long ago as 1973 it was out in the field offering rentals at the customer's site to retrieve data for processing at head office. The bureau companies are still trading profitably, and looking at new areas of business making further use of microcomputer technology.

In the area of larger computers ACT Financial Systems specialise in the

Chris Buckham, Marketing Manager for ACT Sirius, has been responsible for some of the original, not to say outrageous publicity.

provision of software and hardware for banks and financial institutions.

ACT's first involvement with micros was when it formed ACT Microsystems to import the ADDS 70, a US-built machine, and for which it converted its mainframe software. This would have been in 1978/9, when Personal Software in the US were engaged in much the same process of conversion from mainframes for the later renowed VisiCalc. ADDS 70 taught ACT an important lesson: software must be as transportable as possible. When ADDS 75 came along, at very short notice from the manufacturer, ACT's software wouldn't run.

The advantage of having a finger in every pie becomes clear though, for in the meantime ACT had secured the rights to distribute VisiCalc and was in a fine position to exploit the burgeoning success of Apple's hardware. It was a while though, before it managed to get its own micro hardware sales together. For it then started to distribute drives and, later, fully-built micros, made by Computhink.

Scepticism was expressed in some quarters about ACT's ability to support these products properly. To this Ed Sherman makes the point that around the same time ACT acquired a supplies and engineering company by name of Computerproof with field engineering force trained on the Singer Frieden range. They serviced the micro, renamed ACT 800, of which 700-1000 were sold through around 35 dealers, and the disk drives. ACT was in a good position to exact cooperation from the US manufacturer this time round, because it sold about 70% of the micro's total production run. But its problem says Sherman, was that it had its own DOS and BASIC. This was a second lesson for ACT: run with the 'industry standard' (whatever that might be) software products.

Rampant piracy

The Computhink drives had brought ACT into contact with Commodore PET customers, and as a sideline ACT diversified into the cassette software market by acquiring Julian Allason's PETsoft publishing company, and until the market collapsed under the combined pressure of rampant piracy and cheaper disks, this was a profitable operation with a wide range of programs and importantly, contacts. PETsoft subsequently metamorphosed into ACT-Pulsar, the ACT software arm. Julian remains as a non-executive director of ACT as a legacy of the early PET-bashing days and admits to contributing suggestions to the Apricot project.

The Commodore connection led by chance to ACT's good break into volume micro sales. Sirius Systems Technology had been formed in the Spring of 1981 by PET designer Chuck Peddle and financial supremo Chris Fish, both of whom had come out of Commodore, bringing with them a sizeable portion of Commodore's design team.

On ACT's next trip to the US to assess Computhink's next generation of machines, their officers met Peddle. The rest is a matter of recent report. ACT marketed the Sirius strongly here, and achieved good sales, better than in the US where it was running up against the IBM PC. Here of course it preceded the IBM.

But while ACT were beavering away in the UK, Sirius's backer Walter Kidde had, in an attempt to achieve volume sales in world markets, assigned his share of Sirius to an office equipment business, Victor United, whose image needed sprucing up with an injection of high technology. Victor's people, marketing a badge-engineered Sirius known as the Victor 9000, scouted around the world and in Britain lit on DRG, a subsidiary of office equipment and supplies business Dickins and Robinson. DRG, who were not without experience in selling electronic office products, fancied its chances when Chuck Peddle was dragged to London to state publicly that since he had a contract (although indirect) with DRG, he was honour-bound to keep it.

But ACT did not take kindly to DRG's dealers letting it be known that the Victor 9000 was the same thing as the Sirius and what's more two and a half percent cheaper, and exerted diplomatic pressure in the US and economic sanctions against DRG at home. Software suppliers were told to take their business elswhere if they dealt with DRG; and as sterling lurched against the dollar, DRG was compelled to cut its dealers' take. They naturally jumped ship and swam for the larger vessel whose cash tonnage enabled it to ride the storm of the exchange rate with equanimity.

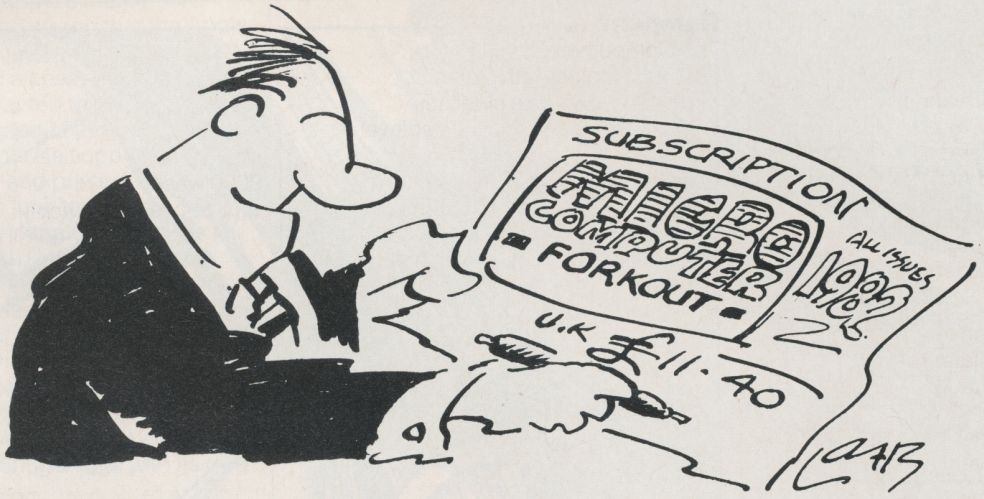
Magnanimity

The DRG protagonists have now gone and the company is a Sirius dealer. One is put in mind of Churchill's maxim about resolution in struggle, magnanimity in victory when one contemplates what Roger Foster's role must have been in this imbroglio, so characteristic of the micro business, which was resolved by a Sirius take-over of Victor; a case of a muscular tail wagging a very shaggy dog.

One also wonders how Visicorp received the news that ACT, after distributing their products for three prosperous years, had now become "too big for their boots" in insisting on unrealistic quotas and margins and that ACT had anyway seen software products that offered better value for money.

Or indeed, how the news has been received in California that a bunch of Brummies are about to – nay already are – manufacturing a personal business computer for world-wide volume sales. Just about anyone sitting in ACT House – or Shenstone House, or the Dudley R & D Centre, or driving around in a service van somewhere – should have some reason to feel pleased about the way things are going for ACT.

Don't miss out.



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"Users are beginning to want systems that provide checks and balances at the point of entry, and are not just electronic notepads. For this type of system, a portable capacity is required..."
– Charles J. Sippl, Microcomputer Dictionary (Second Edition)

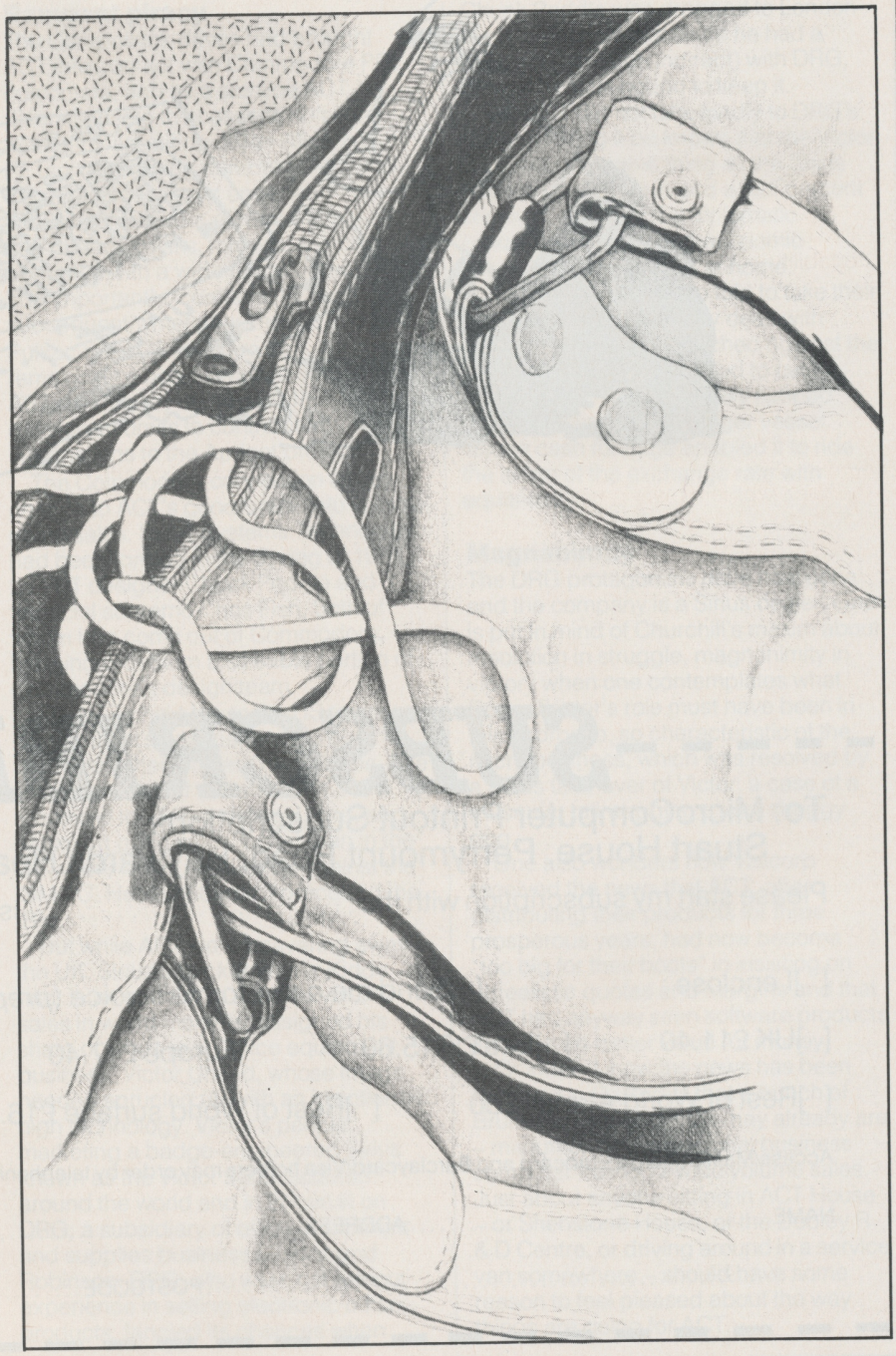
"Adequacy is sufficient – everything else is irrelevant..."
– Adam Osborne

"You can take the Osborne I onto an airplane as hand baggage..."
– Ditto

"Can you really lift one of those damn things?"
– Anon, but not alone

NEW PORTABLE MICROS

Everyone's cashing in on this latest market boom. *John Gowans* highlights the ones to watch out for.



ere we go again, into tyger country. To dictionary doyen Charlie Sippl, a portable computer is some sort of data entry terminal. To Adam Osborne, it is something to be made as cheap as possible, never mind the looks, and shaped to go under airline seats. To our anonymous friend, it is something that would rapidly give the computerised traveller arms like a gibbon and a disposition like a snapping turtle.

It's definition time again.

Long-standing readers may remember that some time ago we filled this slot with an exposition on the new breed of pocket computers. What you won't remember, since I never told you, is the mail I got chastising me for excluding high-powered calculators like HP's 41C from the list.

So to all those who wrote, and for all those fans of pocket data terminals, rest easy. You're not going to like this one either.

See, Mr Sippl – second edition, 1981, notwithstanding – was a bit out of touch on the portable front. There are still portable and even pocket data entry terminals, but when the business talks portability these days it means quite a bit more than that.

For the sake of argument, which is what I'm going to get, here are the ground rules: a portable computer has, all in one box, a display of more than one line, a 'proper' keyboard rather than little calculator-style clicky things, some form of removable mass storage (floppies for instance), and a set of handy interfaces for external things. Oh, and it has some kind of case or handle so you really can pick it up. Or in some cases, as we shall see, try to pick it up.

Boring bit over. The rest is all technological white heat – although it took quite a while for the gas to get lit.

The portable computer has really been a possibility ever since the microcomputer and the floppy disk drive were first put together by that well-known double-act Kildall and Torode in 1974 or thereabouts. But only visionaries would have thought so, with the kind of 8in. floppy drives, giant 8K RAM boards, heavy-duty power supplies, and teletype

STATE OF THE ART REPORT

terminals (remember them?) that were state-of-the-art at the time. Not to mention that a lot of that stuff was in prototype form, and through the roof pricewise, to slip into the Silicon Valley vernacular.

True, some of Apple's marketeers were going around saying that the Apple II was a portable, since all you needed was a TV set and a cassette recorder in the places you wanted to use the machine. This fooled no-one, and the production of separate floppy disk drives, monitors, and printers made Apple change its tune to the now legendary 'home in the US, business in the UK' sales pitch.

Portability was off the agenda, partly because of engineering problems and partly because of cash. Computer boards weren't that simple, power supplies were complicated, bulky, and heavy, monitors were likewise, and floppy drives – well, have you ever tried to lift an original Shugart 8in. with its own power supply?

The cash problem really springs from these factors. The early micro makers were trying to sell to the home hobbyist, who had no money to put up front but was willing to save to feed the hobby. The original machine was sold to be as cheap as possible to hook people in, and then the punters could lay out on the extras as and when they needed them.

The original Commodore PET was the nearest to a full system, with its built-in screen and cassette recorder, but there was no pretence of people being able to carry it around. And the Tandy Model 1, like the Apple, came in bits to be assembled with the familiar spaghetti mix of cables.

The idea that anyone would buy a complete system in a box, with computer, screen, and floppy disks at an exorbitant price, was just not reasonable. And if anyone did, moving it would be a trolley job.

The onward march of technology (Rent-a-cliche Ltd., 1951) changed that. Things got smaller, lighter, more reliable, and above all cheaper, and desktop integrated systems with 12in. screen, twin 5¼" floppies, and the Z8064KCP/M mantra began to appear.

Beginnings

Not portable though. Who needs it? Adam Osborne decided that thrusting young businessmen do, and the Osborne 1 was the memorable result.

What Osborne did looks simple in hindsight. Fed up with writing books and accounting software, he decided to produce a bare-bones CP/M system that would have the same functions as the desktops but would also be cheap – and portable. And with the assistance of a hit-man who could twist the arms of the component suppliers until they screamed Uncle, he presided over the design of the system that bears his name.

Then came the masterstroke. He went to some of the major software houses with the offer of shares in his company and seats on the board in exchange for the rights to give their packages away with every machine sold. MicroPro, Microsoft, Complier Systems, and Sorcim Systems all bit; and when Adam showed off his machine at the 1981 National Computer Conference in Chicago, he was offering a complete twin-disk system with CP/M, Wordstar, MBasic, and SuperCalc thrown in for $1,795. Depending on your point of view, he was either giving the software away or, more radically, giving the hardware away.

With that kind of price/performance deal, observers and pundits found the suitcase-style handle stuck on the back of the machine a distraction at best. Osborne protested that the system was meant to be portable, that the keyboard clipped securely on the front and that the box was shaped to fit under an airline seat, but it was considered to be a gimmick. After all, it weighed as much as a dozen bags of sugar and had those notoriously unreliable floppy disk things in it. No-one in his or her right mind would move it about. No, it would sell on the package price and not on portability.

Besides, it still needed mains power and you couldn't really call that *portable*, could you?

But people could and did, and the Osborne 1 sold in large numbers. Of course the price and the software were a big attraction, but customers started to find applications where portability was a positive plus. And as usual in this business, other makers started to see portability and bundled software as similar positive pluses in the marketplace.

IN A WORD...

CMOS **– Complimentary Metal Oxide Semiconductor. A type of chip which consumes less power than the conventional sort, so can be run off batteries.**

Electroluminescent **– A type of computer display which is flat and solid state like LCD (Liquid Crystal Display) but which emits light like a conventional CRT (Cathode Ray Tube).**

Bubble Memory **– A form of solid-state memory which works on magnetism and retains its contents when power is switched off. Bubble is faster than disks but slower than RAM.**

Direct-connect Modem **– A device which plugs into a telephone socket, for transmitting data 'over the line'.**

Mouse **– Hand-held device which when rolled across a desktop moves a pointer on the computer screen.**

Comms **– Communications software which when used with a modem allows information to be sent to, or received from, another computer.**

Competition

The march of the imitators began.

Their goal was clear – produce a cheap CP/M machine, complete with software, that either mimicked the Osborne cheaper or put right some of the duff features of the Osborne at about the same price.

As those machines emerged and started to sell, another factor came into the business. The IBM PC, soon to be the biggest-selling 16-bit micro, was launched. And another race was on to produce IBM-compatible portables, kind of super-Osbornes, before Osborne got around to it himself as he promised to.

But meanwhile, as Edgar Rice Burroughs used to say as Tarzan was disappearing down a crocodile's gullet for the Nth time, the goal of the portable computer (using my definition, remember?) was being approached from the opposite direction.

The Osborne and its look-alikes were desktops cut down in size and weight, and can be called suitcase computers – or 'luggables' to use Editor Pawson's typically colourful term. The other route is to come up from below, from the calculator and the pocket machines that were already on the market.

And who has cornered the calculator and pocket computer markets? Yes, its those Japanese again.

As recounted in the earlier piece in this series on pocket computers, Sony came up with a thing called the Typecorder a couple of years ago, and Philips had a prototype of something similar. These were just 'proper' keyboards with single-line displays and microcassette drives to store what you typed in. They had batteries, and were really similar to dictation machines.

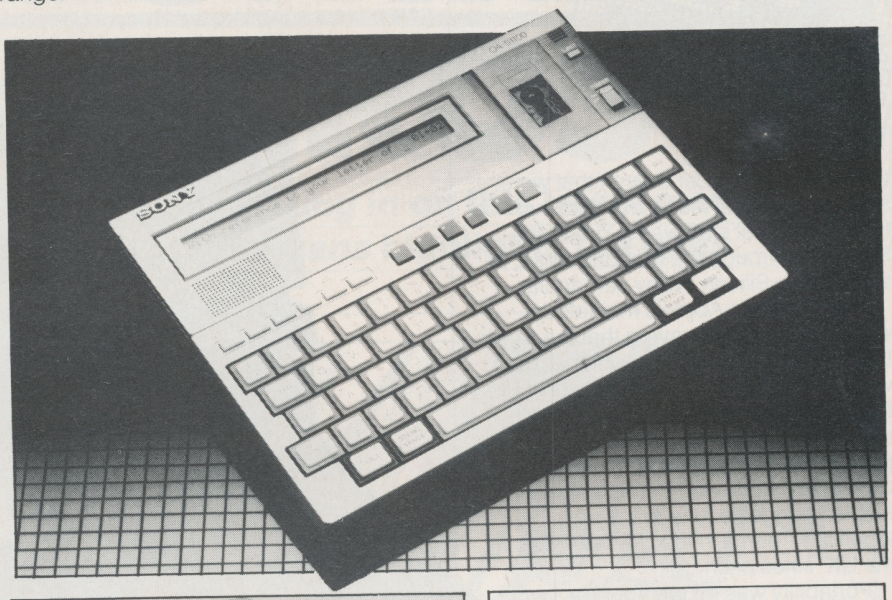
Both things seem to have disapppeared, but the idea of a real computer with a larger display, mass storage,and communications facilities built in – all small enough to fit into a briefcase – certainly hasn't. Led by the Japanese, in the shape of Epson, Sharp, NEC, and the more obscure name of Kyocera, these sytems are coming onto the market now.

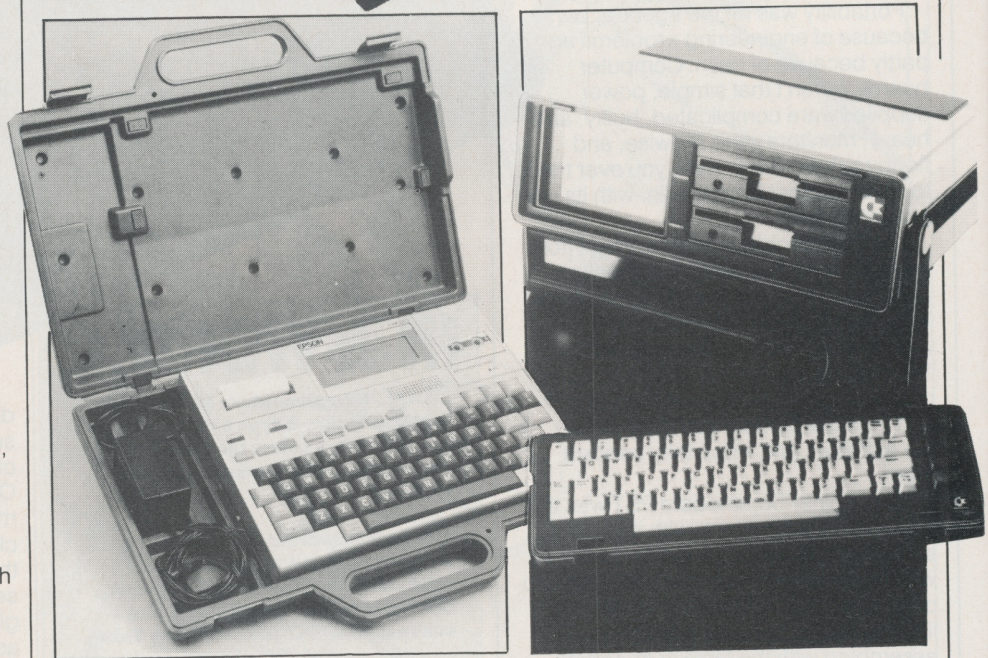
These systems tend to use some new technologies that are now cheap enough for mass production and sales at a reasonable price. Large LCD or electroluminescent display panels, low-power CMOS processor and memory chips, compact modems for communication, and so on.

And from the US, there is upmarket competition either already out or on the way. And some of these start to bridge the gap – the provision of disks and large-capacity screen displays – between the briefcase machines and the suitcase style.

All the developments in technology, and the realisation that there really seems to be a market for portable computing power, mean that there is a large range of systems on the market now. In fact, ignoring the pocket machines and Sippl-style data entry terminals, there are something like 35 available.

So you can't expect me to give full technical details on all of them. All I can do is mention names now and again, and pick out the most interesting products or background stories to lay before my public. And the easiest way to do it is to start just above the pocket level and go right up the long and tortuous route to the top of the luggable range.





Top: the Sony Typecorder. Bottom left: the Epson HX20. Bottom right: the portable Commodore 64.

Epson

The first true portable computer to make a splash was the HX20 from printer king Epson, because of the name and the fact that Epson had the muscle to launch the thing fast in the US and the UK. Weighing in at just under 41lb., it fits my definition with a four-line by 20-character LCD windowing onto a larger display, 16K RAM, expandable to 32K, a truly beautiful keyboard, and an optional plug-in microcassette drive for storage, cash-register-style printer for hard copy, and modem for communications.

Epson did make a marketing cock-up, selling the thing only with Microsoft BASIC and without a ROM word processor that would have suited the machine better to its target market; but outside sources have stepped in with word processing packages on microcassette.

Price in the US, without microcassette or other options, is around $800 – so naturally it costs £500 here from various dealers.

Tandy

Similar in appearance and functions, is the newly-launched Tandy Model 100, which those gullible hacks on the US magazines blithely attributed to the Fort Worth monolith itself. Of course, we are not so easily fooled. My money was on it being an NEC machine that is already out in Japan, but in fact it is a design by Kyocera – and of course that's why I mentioned this less than household name a while back.

The Model 100 caused an even bigger stir in the US than the Epson machine, mainly because of one single feature.

This is a built-in direct-connect modem, that lets users plug straight into the telephone network. There were other features that put it slightly above the Epson – like the built-in ROM software for word processing, address lists, diary functions, and comms, as well as a bigger display showing four lines of 40 characters – but it was the modem that made it, particularly in the US.

Which makes it particularly galling that the UK version will not have the modem in it and will not have one as an option unless Tandy UK moves fast.

Apparently British Telecom approval is the reason for the lack of built-in communications, although this was a deep and dark secret at the time of writing, before the official launch on 28 June. We were not even supposed to know that the modem wouldn't be there. The price, however, is not much of a secret at around £700 for the 8L RAM version. Batteries last for something like 50 hours in full operation, with certain areas of RAM that keep their contents for up to a month, acting as a kind of RAM disk.

Up Market

Then we have to move up the price scale, leaving Epson and Tandy/Kyocera alone in this region of super-typecorders. The next machines in the scale can't be had for under $2,000 in the US.

Here we are thinking of things like the Exidyne Electronic Book, a 4lb. machine with BASIC, 32K RAM, LCD with two lines of 40 characters, and batteries that can drive it for 16 hours, all for just under $3,000. Or things like the Teleram T3000, with 64K RAM, bubble memory up to 256K with CP/M (!), and four-line by 80-column LCD in a 9lb. package for $2,995. Or even the last machine in this non-CRT briefcase-size range, the Compass from Grid Systems. But at around $8000 for a 10lb. package without disks, the Compass needs a little more explanation.

Grid Systems is nothing if not upmarket. The Compass closed up looks like a black plate a couple of inches thick. But inside it has a 16-bit 8086 processor with an 8087 maths co-processor, 256K RAM, 384K of bubble memory, and various interfaces. And open up the lid, and there is a full typewriter keyboard. And look inside the lid and there is an electro-luminescent flat-screen display, with 24 lines of 65 characters, that makes LCDs look sick.

Elegant and powerful indeed, but with a few drawbacks besides the price. The main one is power consumption, which is high because of the tight-packed chips and the technology used in the display. Batteries are completely out, and the temperature of the case when it is running has to be felt to be believed. The Compass has earned its nickname of the GridIron, and if you get fed up with computing you could have a new career opening up as a short order cook.

Grid has only sold a couple of hundred of the things – to rich people – in the last 18 months.

Before leaving the non-CRT systems, there are two more that look pretty remarkable and emerged at the National Computer Conference in Anaheim this May. These are the Sharp MZ-5000 and the Gavilan from a company called – well, Gavilan.

The Sharp 5000 has a fold-up LCD with eight lines of 80 characters,a built-in 80-column printer using a thermal ribbon to print on plain or thermal paper, a full keyboard, and plug in 128K bubble memory cartridges for software and mass storage. Don't hold your breath though, the machine is not scheduled for US launch until early next year, but it does look nice and will cost around $2,000.

The Gavilan looks similar, and weighs roughly the same at around 10lb., but it has two remarkable features the Sharp misses out. Most obviously, it has a Sony 3½in. disk drive built-in, and this can run off batteries. Less obviously, it has a 'solid state mouse'.

This latest thing is unique. just below the LCD display is a touch-sensitive panel, and moving your finger on the panel moves the cursor on the display. Smaller touch panels give commands to back up those entered on the full keyboard.

The Gavilan, including 250K disk drive and built-in modem, runs off batteries for a respectable time and looks a remarkable bit of technology. But once again, regular breathing is recommended. There aren't many of these machines around in the US, and when they will come here is anyone's guess.

But Gavilan – the name, chosen from a list of things that hadn't been bagged as trademarks, apparently refers to a mountain range – is something to watch out for.

Top: the Grid Compass Computer. Bottom: the Gavilan.

more drives.

This area gets heavily populated, naturally enough since it is here that the Osborne clones the IBM-compatible portables make an entrance. To get out of the way the obscurer machines that, so far as I know, are not available here yet: there are the Zeda 525, from Zeda Computers International; the Rover 1 from Rover Computer; the Compucase from Compucase Inc; the Mayflower from High Technologies; the Eagle from Peripheral Systems; the SKS 2500 and 3500 from SKS Computer; and the Star-Lite from Computershop. And even that is by far from complete.

The names to look for in the UK – some already available, some here soon, some that ought to be here soon if the trade gets off its margins – are also various. Here, in no particular order, they are.

One of the early Osborne clones came from Non-Linear Systems, with the Kaypro II. This was a shameless look-alike, but in a metal case with a 9in. 24x80 screen instead of Osborne's odd 5in., and double-density floppy drives with 191K each. But the philosophy was the same. The price was identical, and with the Kaypro you get CP/M. SBASIC, Perfect Writer, Perfect Filer, Perfect Speller, Perfect Calc, and Profit Plan software thrown in.

CK Computers, the Plymouth-based firm set up by Mike Kilmartin when he left DRG Business Machines after the Sirius/Victor fracas, is importing the Kaypro II and will sell it at £1,700.

And it should be worth asking Kilmartin when the Kaypro 10, with one floppy and one 10M Winchester drive, will be over here and what the price will be.

Attache

Much more elegant – and expensive, at $4,000 – is the Attache from Otrona. The screen is the same size as Osborne's, but does 24x80; the twin floppy drives have 360K each; and it has nice graphics. If you want a testimonial, this is the portable Digital Research founder Gary Kildall carries around with him wherever he goes. Maybe because it only weighs 8lb, or because it comes with Wordstar, BASIC-80, the Charton graphics package, and Valet database.

Then there is the Access, from Access Matrix, which weighs in at 33lb. but does include an 80-column dot matrix printer and an acoustic coupler. It has a 7in. 24x80 screen and twin floppy drives, and costs around $2,500 with two BASICs and the same Perfect range as the Kaypro.

Neither of these last two is available here as yet, but one that certainly is – though you might not know it – is the Digital Microsystems DMS-3/F, better known as the Fox.

This has pretty much the same facilities as the Kaypro, a bit heavier at 30lb. with bigger floppies but with no software included in the price. And as that price here is just under £3,000, it does not look like a good deal.

The reason for that is simple. Digital Microsystems does not want it to be a good deal,and is not selling it as a portable micro anyway. The company sells itself on its HiNet local area network, and the Fox to them is just the cheapest workstation you can get for HiNet. End of story. Or not quite the end, since Digital Microsystems is now owned by Extel (as is this magazine, by the way) and is setting up a factory in Twyford to make the range, including the Fox.

Mailmerge, CalcStar, and CBASIC. Sun Computing Services of Feltham has been the first to advertise it here at around £2,000, although the price in the US is under $2,000. That's the way it goes.

Home grown machines from ITCS, the Zita, and from ITCS spin-off Portico, with the Miracle, are also in this category or hereabouts. The Zita has been around for a while, but it is not exactly widely

Top to bottom: the 16-bit Hyperion, the Zorba and the Zita.

Zorba

Oddly enough, a similar story hangs around another new Osborne clone, the Zorba. This time the manufacturer, Telecon Industries of Fort Lauderdale, Florida, has been bought by minicomputer maker ModComp in a kind of Remington deal – we liked the product, so we bought the company. This too is to be made in the UK and Eire, at ModCom's plants over here.

The Zorba is once again Osborne style, but lighter at 22lb. It has a 7in. 25x80 screen, twin Siemens floppies holding 400K each that can read various disk formats, and comes with Wordstar,

available yet, though ITCS have just announced a complete new range called Zita-E which is a lightweight version of their previous design. And the Miracle is still being built, for launch sometime in July. On paper it sounds pretty good.

All these machines have followed the Osborne route, with Z80s, 64K RAM and CP/M, and 5¼in. floppy drives. Jonos has taken a different route for its own portables, going for the still rare but available 3.5in. floppy drives from Sony and the very rare indeed Syquest removable Winchester drives.

This bumps the price up to around $4,000 in the US for the floppy version,

but apart from that the specs are familiar; CP/M, 25lb. weight, 9in. screen, and CP/M, BASIC-80, Multiplan, Spellbinder, and Spellcheck thrown in. No price is available yet for the Syquest version, which replaces the twin 322K Sony floppies with twin 3.9in. Winchester cartridge drives with 5M each.

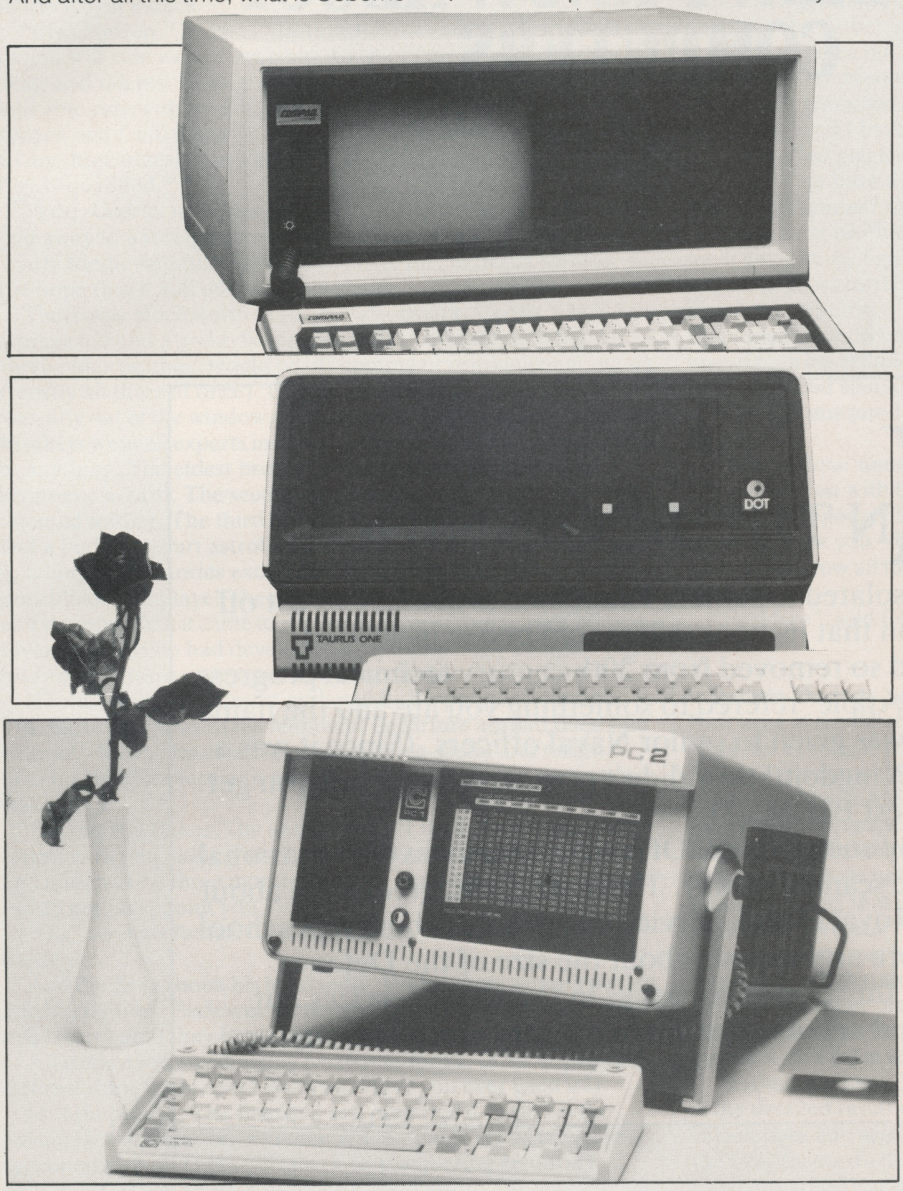
Stopgap

And after all this time, what is Osborne doing to compete? He started it, so he must be doing something apart from the double-density and 80-column screen options for the Osborne 1.

Enter the Osborne Executive, a redesign of the original with a 7in. amber screen, slimline double-density floppies, and 80-column screen on top of the original goodies. This is just about out in the US, despite delivery problems since the launch and resultant financial travails for Osborne's company. The executive was set for launch to the UK trade on July 4th, and will cost £500 or so more than the £1,495 double-density Osborne 1.

Even so, the Executive is just a stopgap in Osborne's stride to IBM PC-compatibility. Adam reckons that this is where the money will be in the next several years, and who's to say he isn't right. The Executive will get an 8088 upgrade with MS-DOS in the near future.

By then however, the IBM-like Executive will have a lot of competition. Osborne is not alone in seeing the cash potential of IBM compatibility, and the PC-clone portables are out already.



Top to bottom: the Compaq, the DOT and the Colby PC2.

First out was Compaq, set up by three exiles from Texas Instruments with the aim of doing a portable that was so compatible with the PC you would need a microscope to tell the difference. The Compaq machine, following its mentor by being grey-imported into the UK by Ferrari Software, costs around $3,000 in the US and comes with 8088, 128K RAM, one or two 320K floppies, 9in. screen, and PC-like keyboard. Weight is 28lb.

Then came the Dot from Computer Devices, a company that made its name selling the kind of portable terminals that our friend Charlie Sippl would love. The Dot is pretty much the same as the Compaq, in price, weight, and most other things. But it can have a built-in printer, has a slightly bigger screen, and uses the same Sony drives as the Jonos.

Hyperion tangles

And then came the Hyperion, from Dynalogic of Ottawa in Canada. This is the one to watch out for in the UK, not least because of the distribution tangles it is causing.

Are you sitting comfortably? Dynalogic produced the machine, and did an OEM deal with printer firm Anderson Jacobson. Then Bytec bought Dynalogic, and looked for its own distribution which it found in the UK in the shape of George Macfarlane's newly-formed Gulfstream Technology. But even as Gulfstream announced the deal, Bytec took that company over too.

Still with me? The Anderson Jacobson announced the machine here as the Ajile, and started doing marketing schemes to beat the Hyperion. Latest news is that Bytec is lowering the boom on the printer maker, saying it can't have any more machines until it changes the design and produces a definitely different system.

All of which is a shame, since the Hyperion is nice. It weighs only 21lb., and comes with an 8088,256K RAM, 7in. amber CRT, twin 320K floppies and an internal RAM disk, and a word processor, Multiplan, and MBASIC. Price here is around £3,000, depending, of course, on who you buy it from. Watch this space.

Other IBM compatibles to watch out for are the Seequa Chameleon, a twin-processor thing that can run CP/M-80 and MS-DOS, and the Corona Portable PC which is not yet out. Both are cheap and neat, and come with software.

One thing all these IBM-type portables have in common is a slight software problem. The IBM ROMs are copyrighted, and some applications use the ROM routines in the PC. The portable copiers have to change the ROMs a bit, and as a result there are some applications that won't run on the clones. All of them produce lists of the IBM PC software that *will* run, with Compaq in the lead in terms of numbers.

This problem is neatly avoided by the Colby PC-1 Conversion Kit. What this does is give you the bits and pieces to build your own portable – using the main board and disks of the desktop IBM PC, and the keyboard too unless you want to take Colby's own clip-on one. The kit costs aroung $900, including the smaller 9in. screen. Now that's what I call portable compatibility.

The answer to Anon is that yes, you really can lift the things. And many people are making the things to lift. Osborne really started something – and he brought one other gift to the world. This article has been written on a clapped out, old cased, standard Osborne 1 using the WordStart provided. Good isn't it?

THE KINGDOM THAT DIDN'T KNOW ABOUT COMPUTERS

IN THE BEGINNING

There was an isolated mountain Kingdom...a country so cut off from civilization that its booksellers sold books instead of ZX81's...a land so removed from 20th century technical progress that the word 'Apple' refered to something you ate and the name 'Commodore' was given to senior Naval officers. (Since it was a MOUNTAIN Kingdom, they didn't possess a Navy, but you get my point Oh Best Beloved?).

It was a happy enough land. Of course, there was the occasional riot, diplomatic scandal or war. There were disagreements about the size of the Royal Health Service and debates about free school milk. There were arguements about the size of the Defence budget and the threatened cut backs in the social services but, when all was said and done, it was a country much like any other.

There was only one major problem. The King was worried about the Royal line of succession. Who should inherit the Kingdom when he died? Which of his four sons would be most suitable as ruler? Normally, the eldest son would have automatically taken the crown but the King was a socially liberated Monarch who believed in individuals *proving* their worth rather than ruling by chance of birth. (Just to put the record straight, the King had NO daughters, Best Beloved. So there was nothing sexist in his approach to the problem. I just wanted to make this clear before proceeding further.)

On his fiftieth birthday, the King had summoned his four sons to the Royal Palace.

"My children," he said, "the time has now come to decide which of you will rule when I am gone. Each of you possesses different skills and talents. I will give you one year to prove yourselves fit and able rulers of our Kingdom. In twelve months from now, the Queen and I will make our decision. This, naturally, only applies to my three oldest sons since they are all brave, intelligent and highly qualified."

"You, Cedric, my youngest son, are a lost cause so I shall send you away to a foreign country to study something obscure like 'Early Medieval Music' or 'The osmotic properties of spinach' in the hope that it will make a man of you."

There was much mirth at the King's remark. Cedric was a strange lad and a great disappointment to his father. While his three older brothers would be off hunting or drinking or argueing (mostly all three at once), Cedric would stay at home and stare vacantly out of the window. No one knew what to do with him. His brothers were all experts in different fields but Cedric wasn't good at anything. The eldest brother was a brilliant financier and economic wizard. The second brother was a fine horseman and talented soldier. The third brother was a scientist of great renown and a budding court astrologer. Cedric? Well, he was quite good at telling funny stories except he could never remember punchlines. He played the piano rather badly and was all fingers and thumbs when it came to removing stones from horses' hooves. Over the years he had developed a total insecurity complex since his brothers were very much more successful.

He was, however, almost pathetically desperate to succeed. Therefore this news of his imminent departure abroad filled him with joy. Maybe he could learn something useful and return to take his rightful place as a genuine competitor in the succession stakes.

"Thank you father," he announced, "I shall study hard and return with new skills. I shall enrolé at the University of Boron and undertake a three month course in applied computer science. I shall not disappoint you."

"Ha!" said his father. "An entirely useless subject as I predicted."

And the King shook his head sadly. His brothers weren't paying much attention. Each was thinking of how best to beat the other two. How could they impress their father?

All three exchanged highly ambitious looks. (This is quite a difficult thing to do, Best Beloved. Have you ever tried it?)

Months passed. The financial son prepared a thesis on the advantages of imposing a 'Value Added Tax'. The soldier son reckoned he could make his mark by conquering an unruly neighbour or two so he trained up a good army. The scientist son invented 'distilled water' and discovered how to tell people's futures with biorhythms. Cedric on the other hand – far away in the land of the Borons – finally discovered his meaning in Life. He changed *completely*, Best Beloved. He fell in love. In love with the very latest offering from the retail electronics trades. He purchased a 'T42' micro-computer ("...16K RAM with integral colour monitor and twin disc-drives") and he simply *couldn't* put it down. After three months of late-night keyboard bashing, he reckoned he was a passable programmer. His brain took off on the wings of silicon and lifted him to new heights of confidence.

"What a machine!" he said to himself. "If I take this home to my country, just think what I could achieve..."

And he thought. And the more he thought, the more he liked what he thought. So he packed up his 'T42' computer in its polystyrene foam box and set off back over the mountains. (In case you're thinking what I'm thinking, Best Beloved, you're *wrong*. There was plenty of electricity in his country. The scientist son had invented street lamps about four years previously. So there!)

"Hi Cedric!" said his economist brother. "'Had a nice time? What have you got there?"

Cedric opened the box.

"It's a 'T42' microcomputer. And I'm a computer programmer now!"

The brother laughed:

"Well that's a waste of time! We don't need computers here. And we certainly have no need of computer programmers. Still, I always knew you were a bumbling idiot. I suppose that learning about computers is no more stupid a thing to do than studying 'Ancient Egyptian Cooking' but both are entirely useless in this country. Our father will be very disappointed with you."

"But hang on a bit. You don't realise what I can do to help you. Computers are absolutely brilliant at financial analysis. I have already programmed an economic model of the country's money problems. And I have a solution."

The brother giggled:

"You? You have a solution? What do you know about import and export quotas? Or how to control the rate of inflation?"

"Well, dear brother, *you're* the expert so you go away and tell me if I've got my figures right."

And without further ado, Cedric unfolded yards and yards of statistical printouts – rows of minimum lending rates versus investment returns, columns of retail price index as against manufacturing efficiencies and pages of forecasting and precasting and simulcasting.

"Crikey" muttered the economist brother as he studied the figures.

"You've done some homework. But, or course, none of this has any connection with the practical realities of running *our* country's economy. This is all just hokum and bunkum. Looks good – I grant you – but it's a lot of old gibberish. Just to make sure, I'll borrow all this for a day or two and see if there's anything useful in it."

"Feel free", said Cedric with a self righteous smile. And so they parted.

Back in his study-bedroom (just below the haunted turret in the East wing of the Palace – this has absolutely nothing to do with the story but I thought you'ld like some colourful description, Best Beloved) the economist brother gazed over the computer printout. He was AMAZED. He checked the maths through with long division on paper and added up the taxation estimates on his fingers. It really seemed to make sense. Why hadn't he thought of these calculations before? This was such a comprehensive financial model that it would take the entire Kingdom's clerical bureaucracy at least five years to calculate the same figures. What a chance to impress his father! He would deliver it to the King tomorrow and that would surely clinch the issue about succession. None of the other brothers would be able to match him! The following day, at the Royal Family breakfast, he produced the papers with a dramatic flourish:

"Father, see here. I have done what you requested of me. Here is the detailed result of five years labour...five years of midnight calculations and academic sweat for your delectation. I have here the 'way forward', the simple paths to follow to make our country prosperous and our citizens wealthy and happy."

The King looked at the figures. *He* was amazed.

"Oh my son, my brilliant financial son, what a genius you are. Did you receive any help with all this?"

"Oh no, not at all, father. I did it all myself," lied the economist.

Cedric wanted to kick him hard under the table but his legs weren't long enough.

The King smiled a wide smile:

"You have done well. I don't think your brothers will be able to match your work."

Cedric was furious. Not only had his brother cheated him of the honour and praise but all that work!...all those hours of typing and research! He would get his revenge. The two other brothers were concerned. How could they defeat the economist's plans? The soldier immediately took his army off to war in a desperate attempt to impress the King and the scientist retreated to his laboratory to finalise a design for a flying machine.

A week later, the soldier brother was laying siege to the castle

of Gorgon. This was an impregnable bastion and no one had ever succeeded in storming the eighty foot walls. The castle belonged to a nasty murderous band of marauding light-bulb thieves and a successful assault would greatly enhance his reputation as well as improve the efficiency of the public street lamp service. But the task was a difficult one.

For three days, the brother ordered his troops forward to the attack and each time his divisions were forced to retreat. The losses were mounting and army morale was sinking fast. He didn't know what to do. The castle walls were simply too high to allow accurate mortar fire.

Cedric knew what he had to do. One morning, he arrived at his brother's command tent with a large polystyrene box.

"Oh hello, little brother," said the soldier. "Things are not going too well here."

"Yes I know all that, but I can help you with the aid of my 'T42' microcomputer," replied Cedric. The soldier brother spat on the floor. (This was a macho thing to do, Best Beloved.)

"You? You help *me*? You, who couldn't fire a gun because you don't like the noise it makes? You, who get ill at the very sight of blood?"

"Hang on a moment dear brother. If I come up with a way to take the castle, will you give me credit for helping you out?"

The soldier laughed loudly:

"Yeah, sure. Hahaha! You help me! That's rich that is..."

And the youngest brother pulled out a few pages of calculations from his 'T42' micro.

"I have worked out that, since the walls are exactly 82.35 feet in height and the effective range of a mortar shell in high altitude conditions is 470 feet, we simply fire a cannon at exactly 48 degrees to the horizontal minus the charge loading in pounds per square inch divided by the wind speed and relative humidity and 'Bingo' – we'll hit him on the nose."

"Oh go on then," said his brother in a bored voice. "I didn't know you had learnt so much about gunnery. I suppose it can do no harm to try!"

And Cedric's orders were carried out. The first shot exploded at the centre top of the castle wall killing half the garrison and so demoralising the remaining defenders that they immediately surrendered. The soldier brother was ecstatic. He returned home to his father to receive an official military triumph.

"Oh my son, my brave and brilliant soldier son, what a genius you are!" acclaimed the King. "You have conquered the dreaded castle of Gorgon and captured all their stolen light bulbs intact! You will be the one to inherit the Kingdom. I am sure no one can beat you. Did you receive any help with your gunnery?"

Cedric stepped forward but go no further than his soldier brother's outstretched foot.

"Oh no, father. I worked out the figures, laid the gun myself and fired it. I knew it would win the battle," he lied with a disarming smile.

Cedric seethed with anger. How dare he! He wanted to speak up but his brother was bigger than he was. He couldn't do anything about it. Or could he?

A week later, Cedric approached the scientist brother.

"Hello, baby brother," said the scientist. "What do you want? Can't you see how busy I am? I'm trying to invent something wonderful or astrologise something out of the future so I can impress father and gain the right to the inheritance."

Cedric lifted up the computer and placed it upon the laboratory desk.

"Well, I can help you. The only thing I ask is that you must promise – absolutely promise – to tell the King how clever I've been when I've helped you out."

The scientist brother flew into a rage and dropped a flask of petrol on the floor.

"Now look what you've done! You make me angry and I drop my new invention all over the floor. Weeks of work wasted! You? Help *me*? What do you know about physics or astronomy? You're a useless idiot!" (You can see how desperate he had become, Best Beloved.)

"Hold on just a little moment, dear brother," said Cedric. "I think you're wasting your time inventing things like petrol. I've done a temporal projection on the micro and motor cars won't be invented for at least ten years. I've got a far better idea but you must promise to tell everyone how clever I am."

"Oh all right then," said the scientist. (It was better to humour the idiot.)

"The King has often said that he wants to give an important garden party for all the dignitaries of the realm. Why don't you analyse all the weather statistics and come up with the most likely sunny day according to previous records?"

"It would take years to go through all those figures," sighed the scientist.

"Yes, but not if you use my computer. Come on let's go..."

It took the pair of them all night to input the DATA. All the statistics were jumbled and sorted and logged and cross-referenced and eventually – just before breakfast – out came the answer: September the 5th. The scientist was very impressed and he agreed to tell the King over breakfast that morning.

"Father," he said, "I have been working for months and months and I believe I now have the ultimate answer to future forecasting. The sunniest day this year will be the 5th September. You can hold your Garden Party on that day and I promise it will not rain."

The King looked up in astonishment:

"Really? Oh, my son! My clever, studious and brilliant scientific son! What a genius you are! I shall certainly hold my important party then. You have done better than any of the others. If you're right, you shall inherit the throne."

And Cedric smiled. He knew it would not – statistically *could* not – rain and his brother had promised to give him the credit for his computer studies once the day had arrived.

Plans for the Garden Party went ahead. All the guests were invited and the Palace looked forward eagerly to the great day.

On the morning of September the 5th, Cedric awoke early. Sunshine poured in through the open window. It was very bright outside. Here was the proof! This was *his* day! He leaned out the window.

The reason it was so bright outside was that everything was white. Yes, it was sunny (statistically correct) but the ground was covered with three feet of snow.

The King was beside himself with rage.

"Fetch me my scientist son!" he roared.

"You are WRONG. WRONG. WRONG! Did you receive any help in concoting this awful crime?"

The scientist pointed at Cedric.

"Yes father. It was *his* idea."

"It was Cedric!"

"It was that bloody computer!"

And that was that, Best Beloved. Cedric was locked away in a lofty tower with his precious computer for company. He spent the rest of his days inventing simulations and games like 'Son of the Kingdom' and 'Snowblaster'". He became quite loony and no one spoke to him ever again. He was quite happy – unlike his brothers...

None of the brothers inherited the Kingdom. The scientist went into exile where he invented the electric toe warmer. He electrocuted himself in a shower.

The soldier lost his head – literally – while experimenting with mortar trajectories.

The economist soon got into trouble because – lacking a computer to help his calculations – he ran out of fingers to count the rising inflation rate of 500%. The Kingdom was eventually sold to an oil prospecting firm and – years later – became the 67th state of the U.S.A. And the King lived to the grand old age of 105 years old, so none of them would have inherited the Kingdom anyway.

This is a sad story, Best Beloved. It proves a number of useful things:

Firstly, when things are going well, computer people are largely ignored, but when things go badly, then computer programmers really get it in the neck.

Secondly, just because computer projections are *statistically* correct, it doesn't mean that the answer is *right*.

Thirdly, three months experience in microcomputing doesn't necessarily mean you are an expert programmer.

Lastly, whatever you do with your micro, it is quite pointless to try and forecast the weather. Meteorologists spend much more time than you do on enormously complex computers but they still get it wrong. So what chance have you got?

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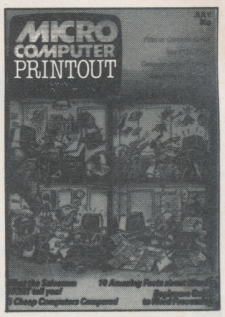

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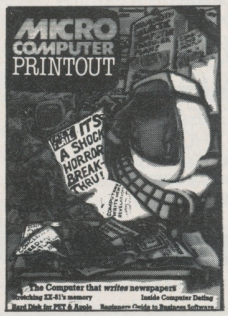

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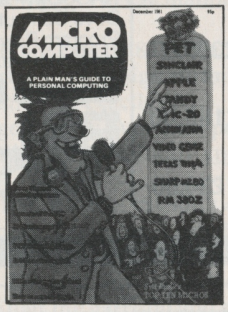

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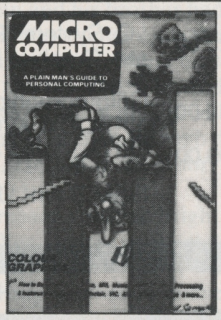

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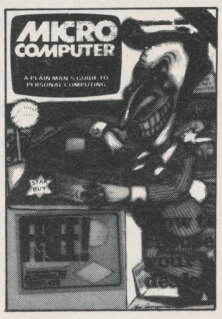

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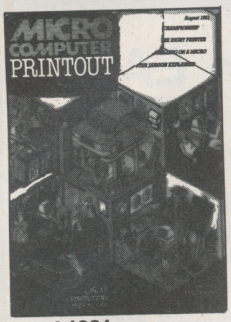

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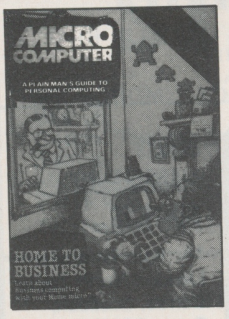

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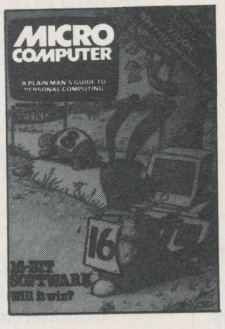

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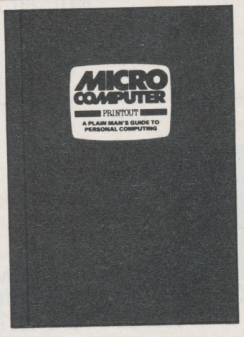

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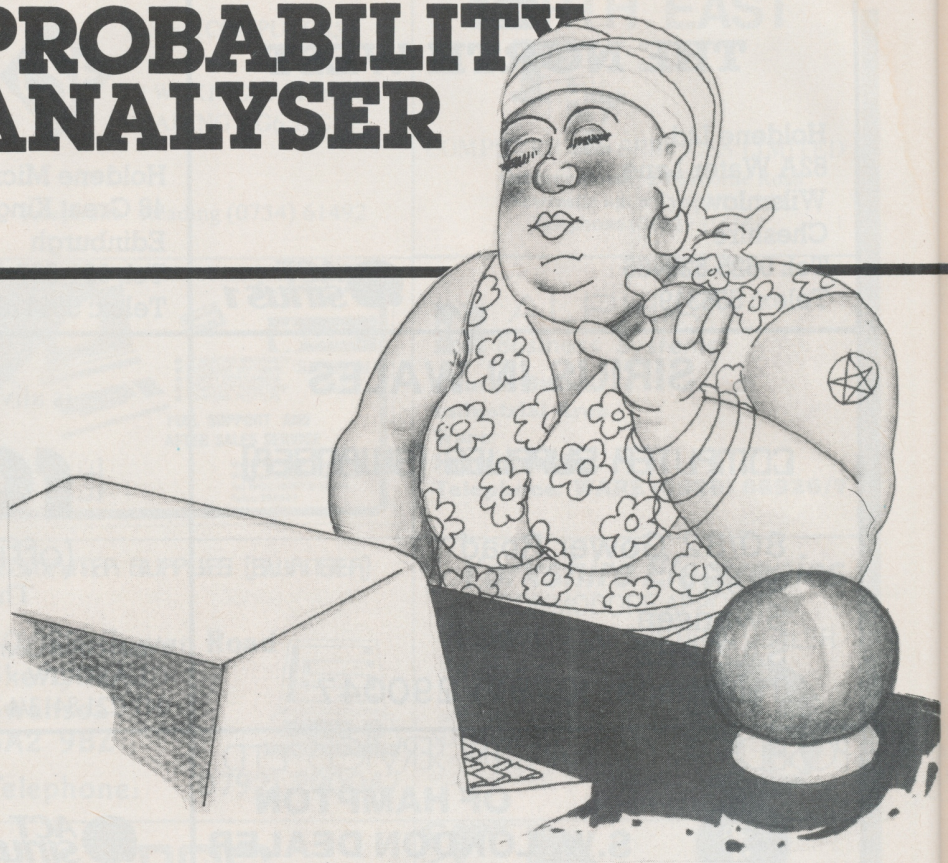
PROBABILITY ANALYSER



Perhaps... if... maybe... supposition is a shaky foundation on which to base business decisions; probability analysis is a little safer. This month *Bob Chappell's* specially commissioned listing offers a program which will analyse the 'ifs' and 'buts' and come up with a firm prediction.

The popularity of astrology columns in daily newspapers reveals how much people want to know what's going to happen next. Reading the tea leaves, gazing into crystal balls, studying the heavens, examining the cards, reading palms: all these and many more are avidly pursued in the hope that all will be revealed.

Hard-headed businessmen would also love to peep into the future. But their curiosity would reveal more than a fanciful wish to see how their lovelife turned out: it would be to ensure that the right business decisions were made *now*, to avoid taking risks which may, or may not, turn out well.

I'm afraid I can't offer you any such glimpse of the future. What I can show you, though, is a little program which can at least take some of the guesswork out of estimating future probabilities and possibilities. It is designed to accept from you relevant factors concerning a future situation, together with estimates of the probability of such factors occuring. The program will then whip through as many trials of this future situation as you like, taking account of all factors and probabilities fed into it. By passing this information through umpteen trials (the more the better), the program can give you an averaged forecast of the most likely outcome. I regret that I can offer no guarantee of the infallibility of the program's forecasts – life simply isn't that predictable! But it will give you a not unreasonable assessment of a prediction, based on a large number of randomly produced trials.

To explain the workings of the program more simply, I'll use a specific example – the readership of *MicroComputer Printout*. The program first asks for the number of factors you want to input. We'll only consider three factors: the economic situation, the future of our beloved Editor, and our competitors. So, in reply to the request for the number of factors, we enter 3.

We must now enter the base value. This is the value that the program will manipulate to produce a new forecasted value. In our case, the base value is the number of readers. I don't know the exact figure but let's say it's 100,000. The next thing we have to tell the program is over how many periods we want the probability calculated. The period can represent anything you want – days, months etc. – it all depends on the situation you are trying to model. The program is not interested in the type of Period, just the number. In our case, we want to know what the readership might be two years from now, so 2 is entered. The next entry is the number of trials we want – the more trials, the more reasonable the forecast. As the program chunters away fairly slowly, we'll only do 100 trials. I'll give you the results for 1,000 trials later so you can test it for yourself.

Finally, we have to supply information for each factor. Bearing in mind that the total probability percentage for each factor must add up to 100, you can enter as many probabilities per factor as you like up to a maximum of 20. In addition, for each probability, you must enter the estimated effect it would have on the base

value. To return to our example. Factor 1 concerns the economic situation: Let's say that there is a 5% chance of it getting worse, with the unlikely effect that our readership would therefore drop by a horrendous 50%. We therefore enter 5 for the probabilities and − 50 (as it's a decrease) for the effect. Other probabilities for this factor are estimated as follows:-

Upsurge in economy	40%	Effect on readership	+40%
Boom in economy	2%	Effect on readership	+100%
Economy static	53%	Effect on readership	+20%

There is no need to enter the % or + symbols (but don't forget the minus sign for a decrease value). To complete the entries for a factor, simply type an *. The program will check to ensure all probabilities for a factor add up to 100% and request revised input if they do not.

The remainder of our estimates could be as follows:-

Change in Editorship

Editor resigns	1%	Effect on readership	−40%
Editor stays	99%	Effect on readership	+20%

Competitors

Lower prices	1%	Effect on readership	−5%
More magazines	10%	Effect on readership	−5%
Give up!	10%	Effect on readership	+20%
Stay the same	70%	Effect on readership	+15%

The program will now start randomly selecting probabilities; the higher the probability, the more chance it will have of being selected. It will do this for all factors for as many periods as you have specified. It will then continue to do all this again for as many trials as you have specified. In our example, we have 3 factors, 2 years and 100 trials so the total selections will be 3×2×100 = 600. As it is run, the program shows you how far it has reached.

The final display gives the predicted result, together with the standard deviation (for those of a statistical bent). Our example led to a prediction that, by the end of two years, MCP readership will rise from 100,000 to 302,063. Running it over 1000 trials produced a prediction of 293,557 readers. Good news for the Editor!

The program allows you to run the same data again with a different number of trials and periods. To use new data, you must start again. Naturally, the program relies on the realism of your estimates, but even so, I think many businessmen will find that it takes some of the donkey-work out of forecasting. A prosperous future to you all!

Each month, *MicroComputer Printout* commissions Bob Chappell to write one quality program listing. This month *Probability Analyser* was written for a Commodore 64, but designed so that conversion for other micros should only take a matter of minutes.

In recent months the following programs have been published: *Tree Tracker*, *The Loan Gauger*, *Mileage Economy*, *Choice Optimizer*, *Speed Reading*, *Critical Path Analysis*, *Chess Recorder* and *Meeting Scheduler*. Back issues are available from the editorial address at a cost of £1.25 inc. p&p.

OUTLINE OF MAJOR ROUTINES

50-90	Initialise
100-250	Get number of trials, etc.
260-460	Get information on factors
470-580	Check information adds up
590-720	Control loops
730-790	Select a probability
800-830	Update the base value
840-870	Accumulate the new base value
880-910	Calculate average base value
920-970	Calculate standard deviation
980-1060	Display the results
1070-1210	Offer to run again
1220-1250	Pause routine

MAJOR VARIABLES

P(A,B,2)	A for each factor B for each probability per factor % probability and % effect on base value P(A,21,1) holds total number of probabilities for this factor
PV(3000)	New base value per trial
TV	Accumulated base values
TT	Total number of trials
TP	Total number of periods
TF	Total number of factors
BV	Original base value
AV	Average value
SD	Standard deviation

Reverse heart is Clear Screen.
Reverse R is Reverse On.
Black Square with low horizontal line is Reverse Off.

QUALITY LISTING

```
10 REM*************************************************************
20 REM*** PROBABILITY ANALYSER *** BOB CHAPPELL*** 12/5/83 ***
30 REM*************************************************************
40 REM*******************
50 REM*** INITIALISE ***
60 REM*******************
70 A$="":TP=0:TT=0:J=0:K=0:F=0:T=0:L=0:BV=0:UD=0:WD=0:TV=0:R=0:AV=0:SD=0
80 LN$="========================================"
90 DIMP(20,21,2),PV(3000)
100 REM*******************
110 REM*** INPUT DATA ***
120 REM*******************
130 PRINT"■       ▒ PROBABILTY ANALYSER ":PRINT:PRINTLN$
140 PRINT:INPUT"HOW MANY FACTORS (1-20)";A$:F=INT(VAL(A$)):PRINT
150 IFF<1ORF>20THENPRINT"▒ NUMBER MUST BE IN RANGE 1-20 ":GOSUB1250:GOTO130
160 PRINT:INPUT"WHAT IS THE BASE VALUE";A$:PRINT
170 BV=VAL(A$):IFBV<1THENPRINT"▒ INVALID ENTRY ":GOSUB1250:GOTO160
180 GOSUB190:GOSUB230:GOTO260
190 PRINT:PRINT"OVER HOW MANY PERIODS IS THE PROBABILITY"
200 INPUT"TO BE CALCULATED";A$:PRINT
210 TP=INT(VAL(A$)):IFTP<1THENPRINT"▒ MINIMUM IS 1 ":GOSUB1250:GOTO190
220 RETURN
230 PRINT:INPUT"HOW MANY TRIALS DO YOU WANT";A$:PRINT
240 TT=INT(VAL(A$)):IFTT<1THENPRINT"▒ MINIMUM IS 1 ":GOSUB1250:GOTO230
250 RETURN
260 FORJ=1TOF
270 K=1
280 PRINT"■";TAB(11);"FACTOR";J
290 PRINTLN$:PRINT
300 PRINT"PROBABILITY % MUST ADD UP TO 100.":PRINT
310 PRINT"      TYPE * IF FINISHED.":PRINT:PRINTLN$
320 PRINT:PRINT"ENTER PERCENTAGE VALUE (1 TO 99) OF
330 PRINT:PRINT"PROBABILITY";K;:INPUTA$:PRINT
340 IFA$="*"ANDK>1THENK=K-1:GOTO500
350 IFA$="*"THENPRINT"▒ NO % ENTERED FOR THIS FACTOR ":GOSUB1250:GOTO280
360 PB=VAL(A$)
370 IFPB<1ORPB>99THENPRINT"▒ VALUE OUT OF RANGE ":GOSUB1250:GOTO280
380 P(J,K,1)=PB/100
390 PRINT:PRINT
400 PRINT"ENTER PERCENTAGE DECREASE/INCREASE
410 PRINT:PRINT"(-100 TO 100) OF BASE VALUE FOR
420 PRINT:PRINT"PROBABILITY";K;:INPUTA$
430 PRINT:UD=VAL(A$)
440 IFUD<-100ORUD>100THENPRINT"▒ VALUE OUT OF RANGE ":GOSUB1250:GOTO390
450 P(J,K,2)=(100+UD)/100
460 K=K+1:IFK<21GOTO280
470 REM************************************************
480 REM*** TOTAL OF PROBABILITIES FOR THIS FACTOR ***
490 REM************************************************
500 P(J,21,1)=K
510 REM*********************************************
520 REM*** CHECK PROBABILITIES ADD UP TO 100%  ***
530 REM*********************************************
540 T=0:FORL=1TOK:T=T+P(J,L,1):NEXT
550 IFT=1GOTO580
560 PRINT"▒ TOTAL PROBABILTY % DOES NOT EQUAL 100 ":GOSUB1250
570 PRINT:PRINT"▒ PLEASE RE-ENTER ":GOSUB1250:GOTO270
580 NEXTJ
590 REM*****************************
600 REM*** LOOP FOR EACH TRIAL ***
610 REM*****************************
620 TV=0:FORJ=1TOTT:WV=BV
630 PRINT"■":PRINT:PRINT"▒ TRIAL ■";J
640 REM*****************************
650 REM*** LOOP FOR EACH PERIOD ***
660 REM*****************************
670 FORK=1TOTP
680 PRINT:PRINT"▒PERIOD ■";K
690 REM*****************************
700 REM*** LOOP FOR EACH FACTOR ***
710 REM*****************************
720 FORL=1TOF
730 REM*****************************
740 REM*** SELECT A PROBABILITY ***
750 REM*****************************
760 M=P(L,21,1):V=0
770 FORN=1TOM:R=RND(0)
780 IFR<=P(L,N,1)THENV=P(L,N,2):N=M
790 NEXTN:IFV=0GOTO760
800 REM*********************
810 REM*** ADJUST BASE ***
820 REM*********************
830 WV=WV*V:NEXTL,K
840 REM*****************************
850 REM*** ACCUMULATE NEW BASE ***
860 REM*****************************
870 PV(J)=WV:TV=TV+WV:NEXTJ
880 REM*********************
890 REM*** AVERAGE BASE ***
900 REM*********************
910 AV=TV/TT
920 PRINT"■":PRINT PRINT"       ▒ PREPARING RESULTS "
930 REM*****************************
940 REM*** STANDARD DEVIATION ***
950 REM*****************************
960 SD=0:FORJ=1TOTT:SD=SD+(PV(J)-AV)↑2:NEXTJ
970 SD=SQR(SD/TT)
980 REM*************************
990 REM**** DISPLAY RESULTS ***
1000 REM*************************
1010 PRINT"■       ▒ PROBABILTY ANALYSER ":PRINTLN$
1020 PRINT:PRINT"▒ BASE VALUE          ■";BV
1030 PRINT:PRINT"▒ TRIALS              ■";TT
1040 PRINT:PRINT"▒ PERIODS             ■";TP:PRINT:PRINTLN$
1050 PRINT:PRINT"▒ AVERAGE BASE        ■";AV
1060 PRINT:PRINT"▒ STANDARD DEVIATION ■";SD:PRINT:PRINTLN$
1070 REM*******************
1080 REM*** RUN AGAIN ***
1090 REM*******************
1100 PRINT:PRINT"WOULD YOU LIKE TO RUN THIS AGAIN WITH"
1110 PRINT:PRINT"A DIFFERENT NUM3ER OF
1120 PRINT:INPUT"TRIALS/PERIODS (YES OR NO)";A$
1130 IFLEFT$(A$,1)<>"Y"GOTO1160
1140 FORJ=1TOTT:PV(J)=0:NEXT
1150 PRINT"■":GOSUB190:GOSUB230:GOTO620
1160 IFLEFT$(A$,1)<>"N"GOTO1100
1170 PRINT"■":PRINT"WOULD YOU LIKE TO RUN ANOTHER SET "
1180 INPUT"OF DATA (YES OR NO)";A$
1190 IFLEFT$(A$,1)="Y"THENRUN
1200 IFLEFT$(A$,1)<>"N"GOTO1170
1210 END
1220 REM*********************
1230 REM*** PAUSE ROUTINE ***
1240 REM*********************
1250 FORL=1TO3000:NEXT:RETURN
```

sinclair special

1

Inside...
Latest prices round-up...
Latest software...
Order form...

Introduction

One thing's certain about the Sinclair world – there's never a dull moment.

Every month sees new software and new hardware, produced by Sinclair enthusiasts, or produced by Sinclair itself.

The magazines do a fantastic job of keeping you up to date with the input of enthusiasts. We want to keep you in touch with Sinclair's own developments.

Every month, there'll be a Sinclair Special in this magazine.

Sometimes, inevitably, there won't be anything new to say – we want to break away from the breathless announcements of hardware and software you just can't buy.

But when something new *is* available, we want you to have accurate information – fast. You'll find it here.

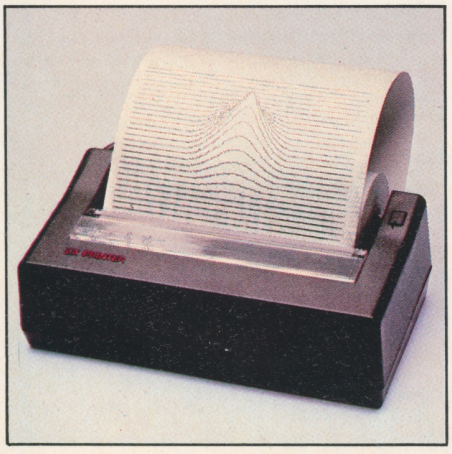
This month, we're giving you the latest information on the recommended retail prices of Sinclair equipment. They're *our* prices, and you may well find things cheaper (or dearer) in the shops. If they're cheaper – terrific! Snap them up. Note, however, that from us the ZX81 is down to £39.95.

We're also announcing six superb new Sinclair cassettes for the Spectrum, and three more which make full use of the ZX81. There's an order form at the back of this Special.

Next month... but there, next month is another story! Watch (as they say) this space.

Nigel Searle

Nigel Searle.
Managing Director,
Sinclair Research Ltd.



Spectrum – latest recommended retail prices.

16K was £125.00
16K now £99.95

48K was £175.00
48K now £129.95

ZX Printer was £59.95 — ZX Printer now £39.95
ZX81 was £49.95 — ZX81 now £39.95

Six new ways to make more of your Spectrum.

Take a look at these brand-new titles. Each is an outstanding new program using the full potential of the Spectrum, for games with stunningly animated graphics, for strategies of fiendish cunning, for masterly applications of computing capability...

Cyrus-IS-Chess Based on the Cyrus Program, which won the 2nd European Microcomputer Chess Championship *and* trounced the previously unbeaten Cray Blitz machine. With 8 playing levels, cursor piece-movement, replay and 'take-back' facilities, plus two-player option. The 48K version has many additional features including an extensive library of chess openings. For 16K or 48K RAM Spectrum.

Horace and the Spiders Make your way with Horace to the House of Spiders, armed only with a limited supply of anti-spider-bite serum. In the house, destroy the webs before the spiders can repair them. Then destroy the spiders, before *they* destroy Horace! Undoubtedly the creepiest Horace program ever produced! For 16K or 48K RAM Spectrum.

Computer Scrabble The famous board game, on-screen – with the whole board on view! A huge vocabulary of over 11,000 words. Full-size letter tiles, four skill levels – the highest of which is virtually unbeatable. For 1 to 4 players. For 48K RAM Spectrum.
(SCRABBLE trademark and copyright licensed by Scrabble Schutzrechte und Handels GmbH – a J.W. Spear and Sons PLC subsidiary.)

Backgammon A fast, exciting program, with traditional board display, rolling dice and doubling cube. Four skill levels. For experts – or beginners. (Rules are included – it's the quickest way to learn the game.) For 16K or 48K RAM Spectrum.

FORTH Learn a new programming language, as simple as BASIC, but with the speed of machine code. Complete with Editor and User manual. For 48K RAM Spectrum.

Small Business Accounts Speeds and simplifies accounting work, produces Balance Sheets, Profit and Loss information *and* VAT returns. Complete with User manual. For 48K RAM Spectrum.

Overleaf – your Sinclair order form.

Three new ways to get the best out of your ZX81.

The range of Sinclair software for the ZX81 continues to grow.

These three new cassettes offer two totally different challenges to you and your ZX81. The games – like so many ZX81 games today – really do use the ZX81's capability. The FORTH program is a fascinating extension of your own computer understanding.

Sabotage Defender or attacker? The choice is yours in this exciting game.

Be the Guard and defend the randomly placed boxes of ammunition inside the compound – or be the Sabateur and attack the ammunition!

Written by Macronics for a ZX81 with 16K RAM. Cassette price: £4.95.

City Patrol You are the Commander of a laser-firing ship. Your task is to intercept and destroy alien suicide ships descending on your city. Judge your rating as Commander by how many aliens you destroy and how much of your city survives.

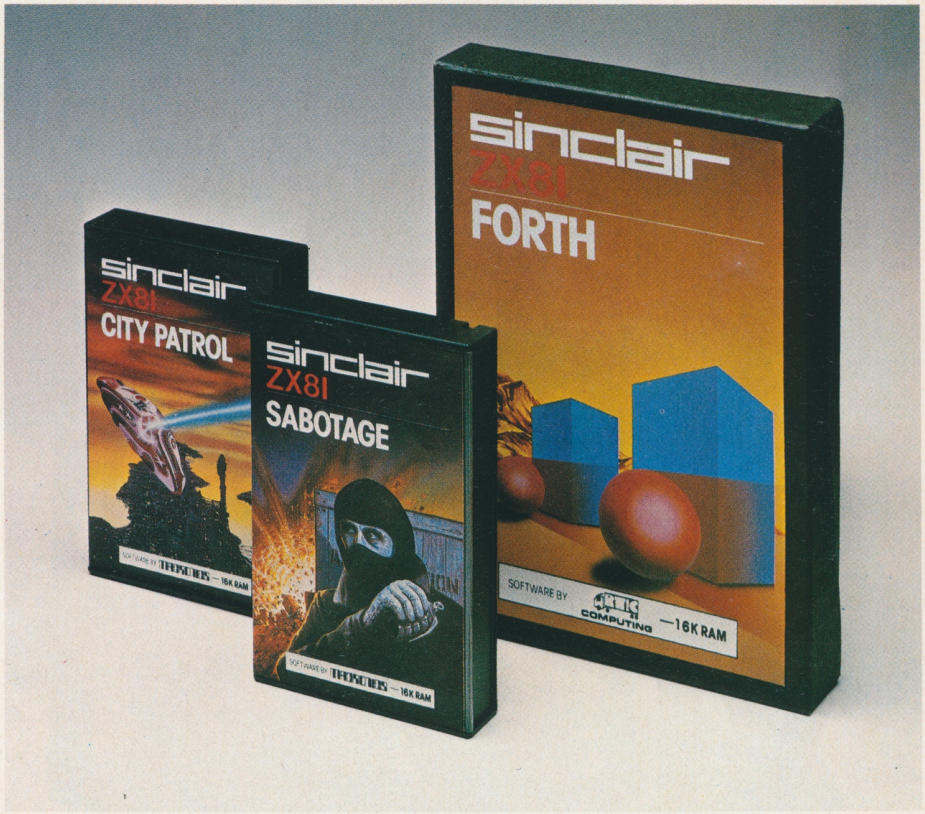
Written by Macronics for a ZX81 with 16K RAM. Cassette price: £4.95.

FORTH Discover a new programming language which combines the simplicity of BASIC with the speed of machine code.

FORTH's compiled code occupies less than a quarter of the equivalent BASIC program and runs ten times as fast. It is fully extendable by the addition of user-defined commands.

Free User-Manual and Editor Manual with each cassette.

Written by Artic for a ZX81 with 16K RAM. Cassette price: £14.95.



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	B6 /S:Small Business Accounts	4605	12.95	
	FOR ZX81			
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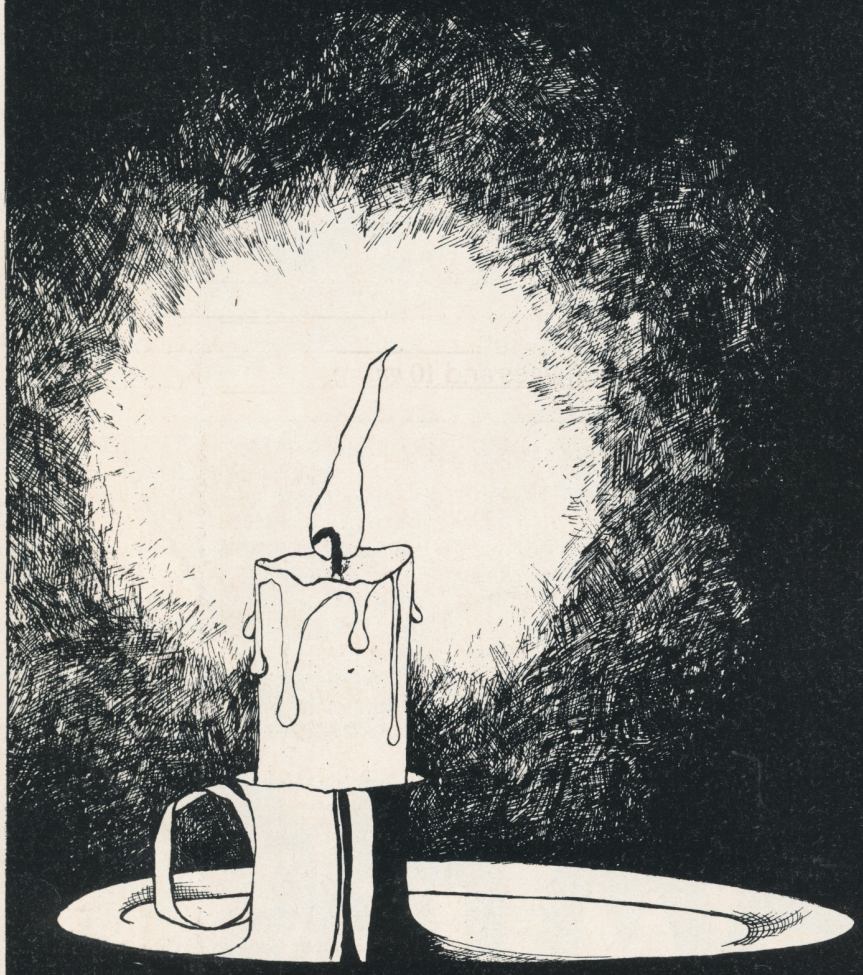

There is still a mystique about computing. At times it seems that the initiated few conspire to keep everyone else in ignorance.

At *MicroComputer Printout* we take a different line.

Every month we write this magazine with the newcomer in mind. Our aim is to bring you to an understanding of the micro world as painlessly and as speedily as possible. Nonetheless, we are the first to agree that there's a certain 'minimum knowledge' barrier which, if you don't know the jargon, can prohibit a full understanding of our regular masterpieces.

So we compiled a kit entitled 'How to buy your computer'. In a concise, highly informative style it explains what bits and buses are, what 16K RAM *really* means, and how to read between the lines of the sales blurb.

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